

FIG. 1

200

226

BARTERER ORDER				
HAVE	QTY	VALUE	WANT	VALUE
DD	45	20	AET	90

228230232234236

216

BARTER DATA					
TRANS-ACTION	HAVE	QTY	VALUE	WANT	VALUE
2221	AET	100	MKT	OMX	MKT-3%
4890	AET*	75	85	DD*	16
6034	AET*	100	90	DD	MKT
5564	DD	300	17	AET	74
9021	DD	110	MKT	RHAT	MKT
3752	OMX*	30	41	RHAT*	25
7657	OMX*	35	45	DD	20
3360	OMX*	40	MKT	RHAT	18
8290	RHAT	50	19	AET	MKT
0077	RHAT*	20	18	AET	MKT
1779	RHAT	15	MKT	OMX	29

204206208210212214216218220222224

FIG. 2

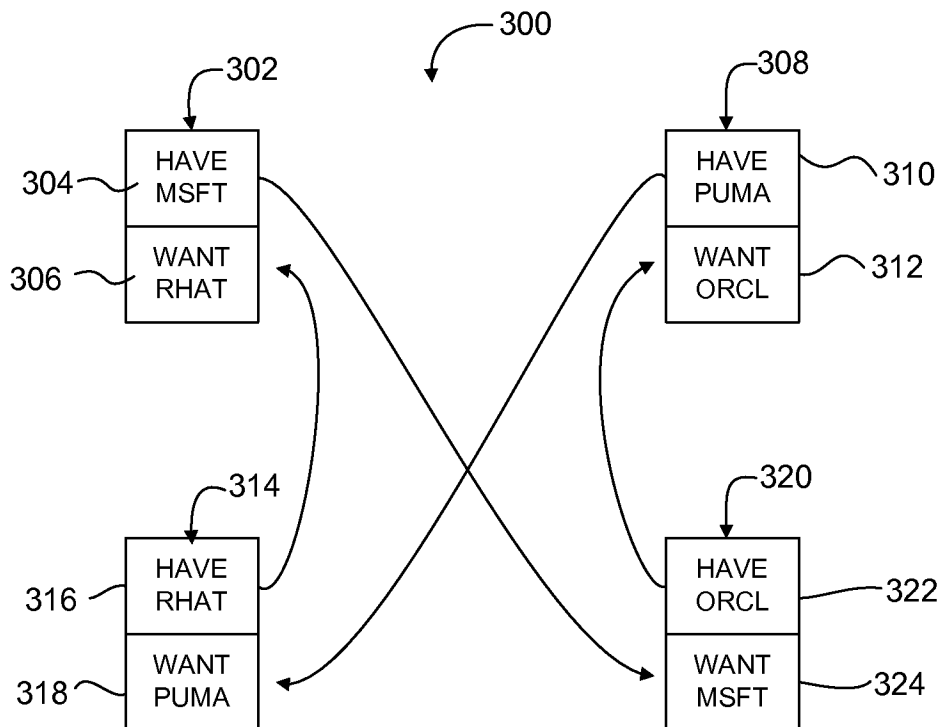
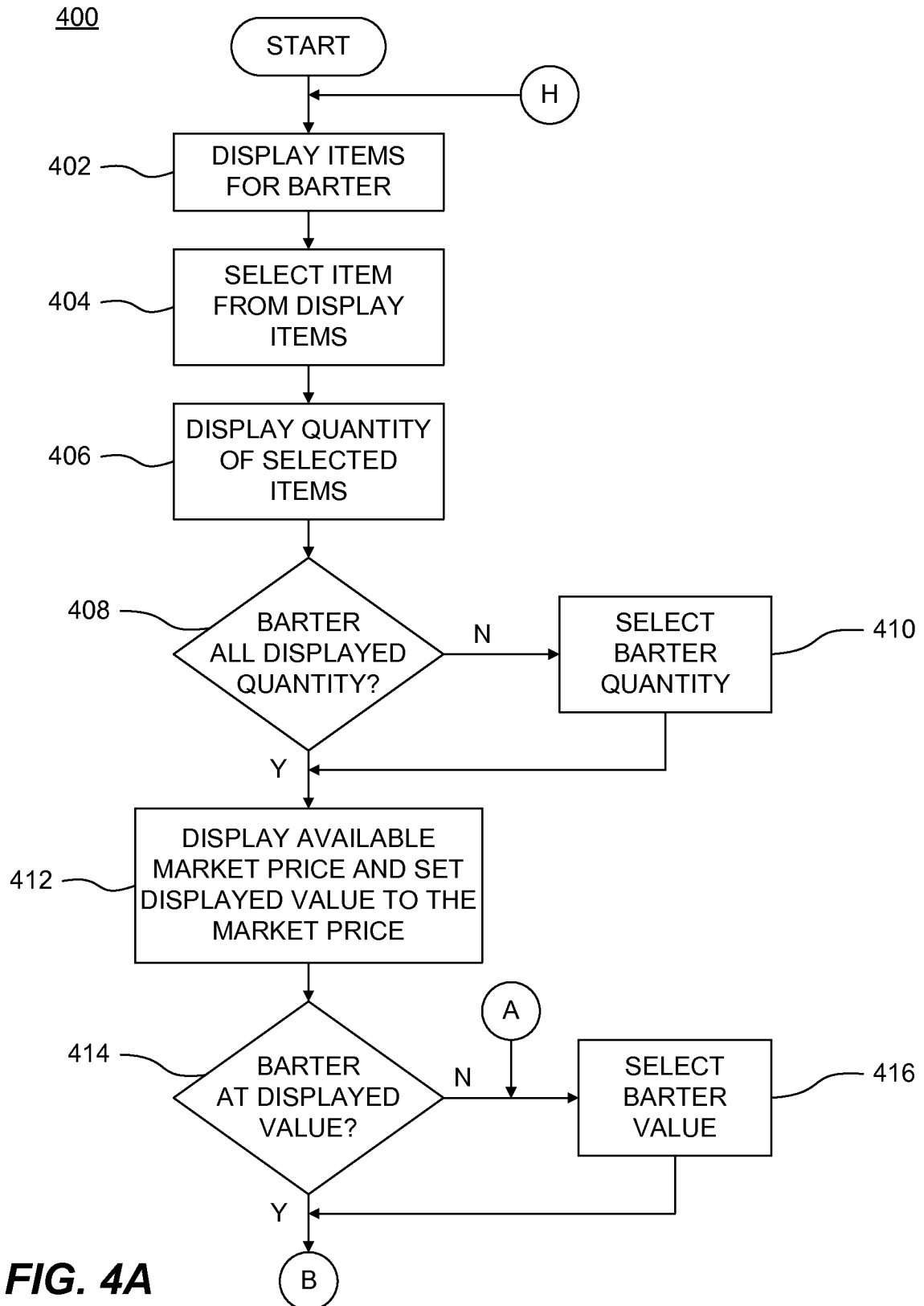


FIG. 3



400

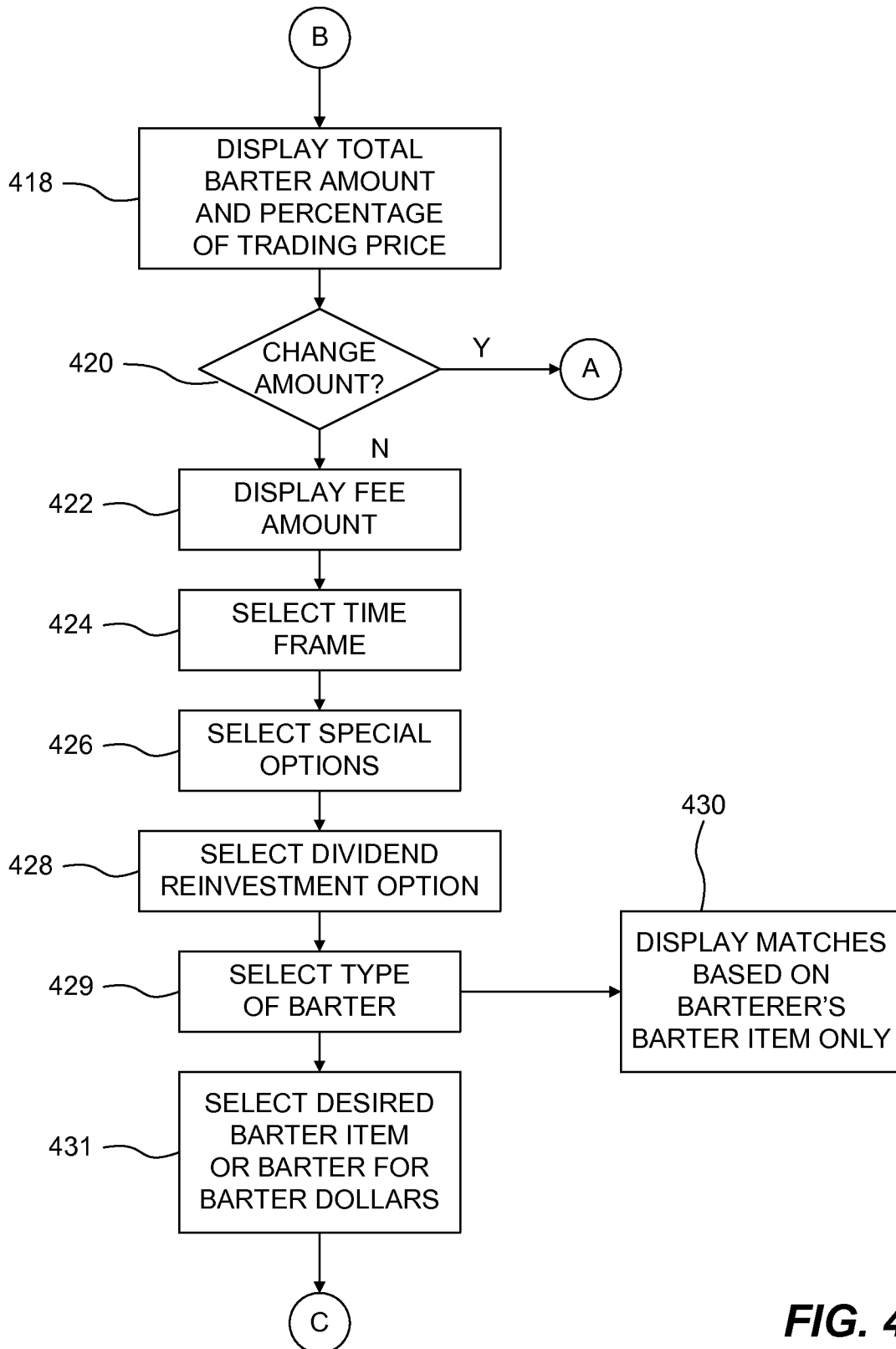


FIG. 4B

400

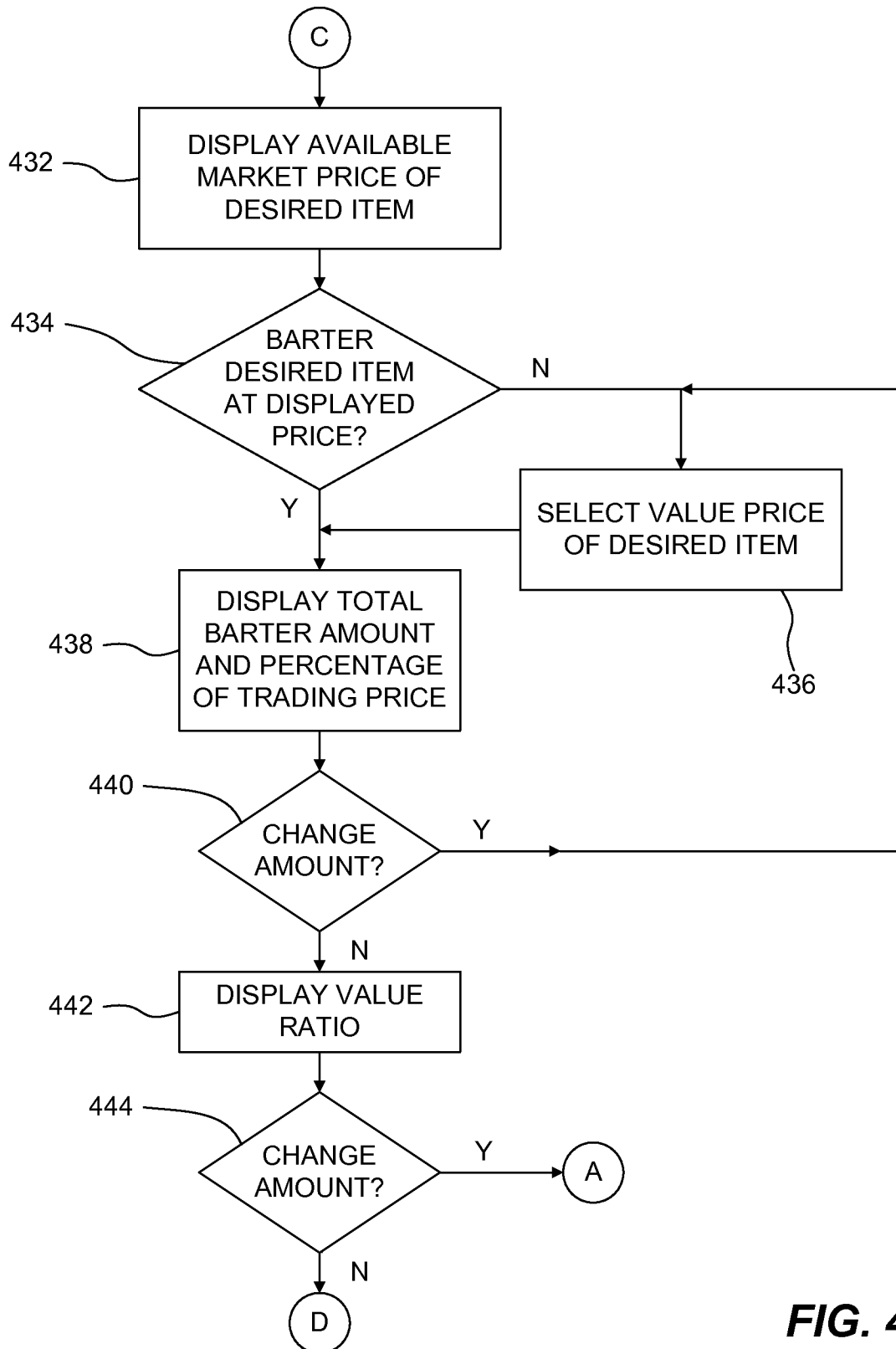


FIG. 4C

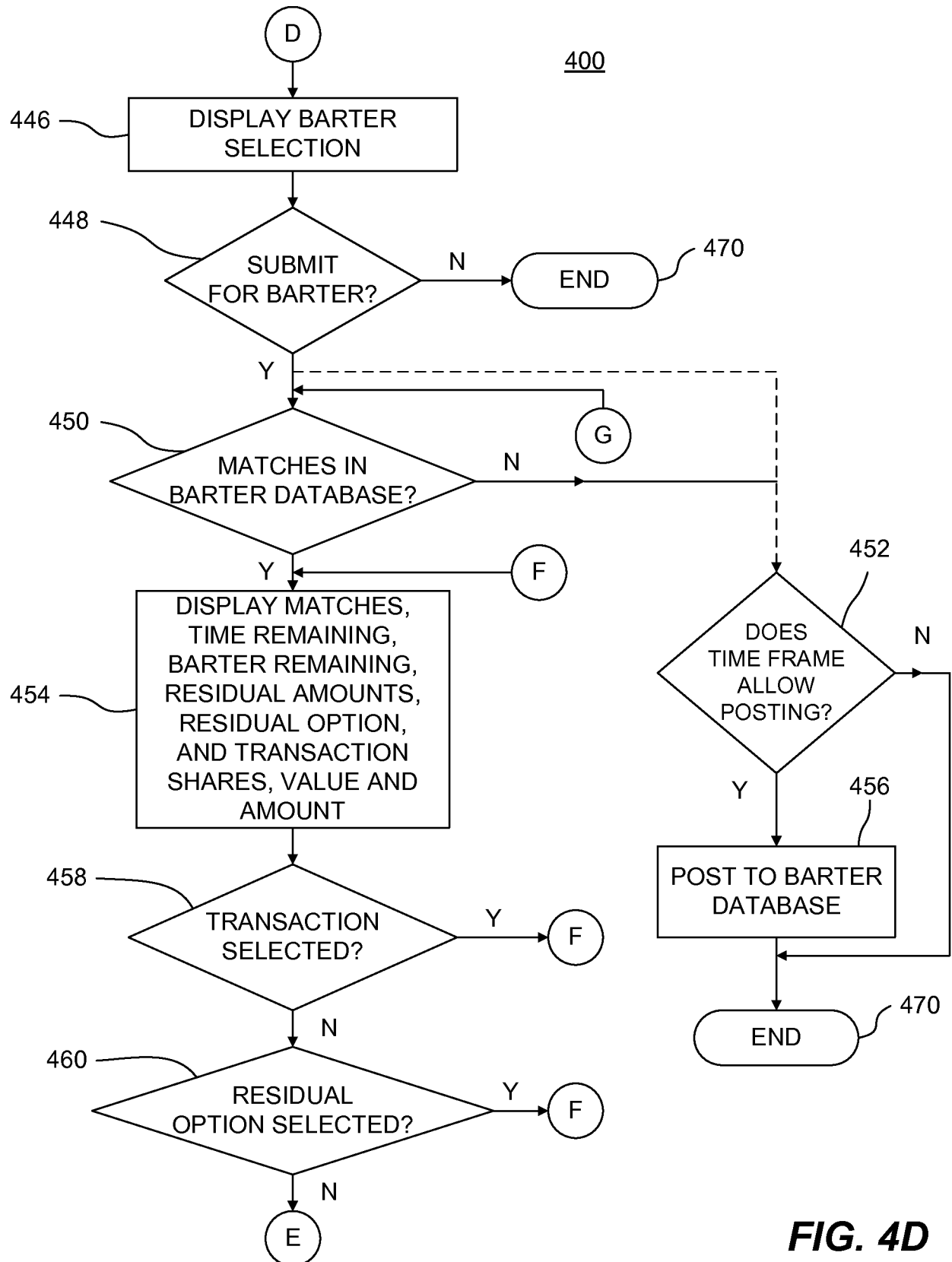


FIG. 4D

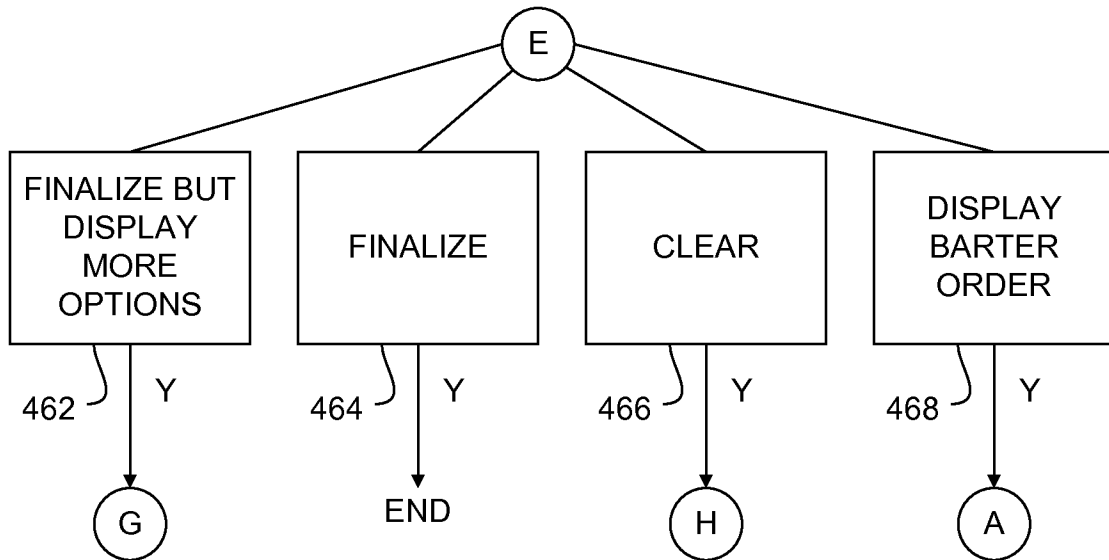


FIG. 4E

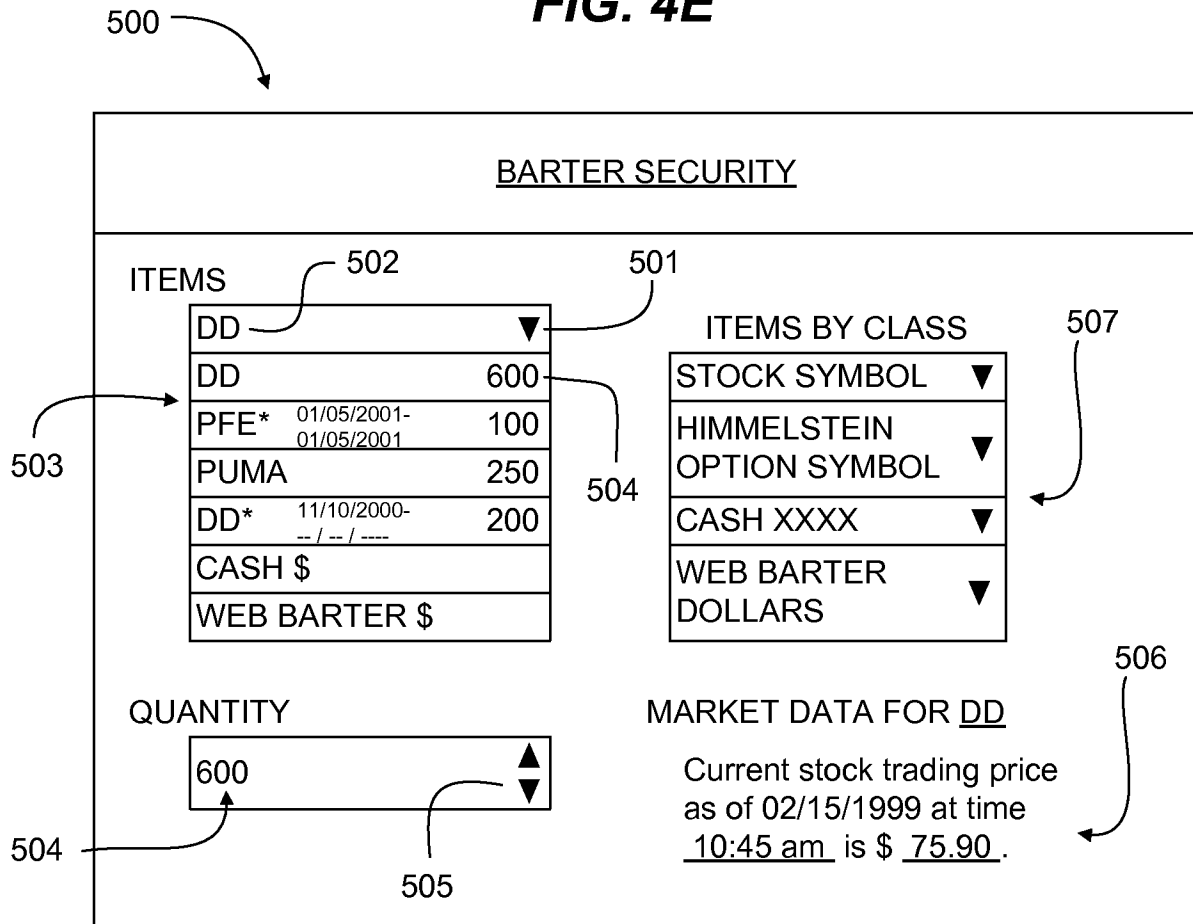


FIG. 5A

508 VALUE \$ ▲▼

OR

per share,
web barter dollars,
cash

510 ☐ If stock or Himmelstein Option,
barter at current stock trading price

511 \$ +/-

OR

512 % +/-

☐ plus
VALUE \$ 514 ▲▼

OR

518 PERCENT % 516 ▲▼

☐ minus
VALUE \$ 517 ▲▼

520 OR

PERCENT % 519 ▲▼

522 Total anticipated barter amount: _____ .
Note: Your value price is "X" percentage/dollar amount less/more than (or equal
to) stock trading price.

523

FIG. 5B

524	FEE AMOUNT per share is anticipated to be _____, if direct barter (total anticipated fee _____);																	
526	FEE AMOUNT per share is anticipated to be _____, if web barter (total anticipated fee _____);																	
528	TIMING <table border="1"><tr><td>day only</td><td>▼</td></tr><tr><td>day only</td><td></td></tr><tr><td>good until canceled</td><td></td></tr><tr><td>fill or kill</td><td></td></tr><tr><td>immediate or cancel</td><td></td></tr><tr><td>only view current posts</td><td></td></tr></table>	day only	▼	day only		good until canceled		fill or kill		immediate or cancel		only view current posts						
day only	▼																	
day only																		
good until canceled																		
fill or kill																		
immediate or cancel																		
only view current posts																		
530	<u>SPECIAL CONDITIONS</u> (OPTIONAL) <table border="0"><tr><td><input type="checkbox"/></td><td>Minimum quantity</td><td><table border="1"><tr><td>600</td><td>▲ ▼</td></tr></table></td></tr><tr><td><input type="checkbox"/></td><td>do not reduce</td><td></td></tr><tr><td><input type="checkbox"/></td><td>all or none</td><td></td></tr><tr><td><input type="checkbox"/></td><td>deferred settlement date before _____ date after _____</td><td></td></tr><tr><td><input type="checkbox"/></td><td>Other security, if any, to be provided at settlement _____</td><td></td></tr></table>	<input type="checkbox"/>	Minimum quantity	<table border="1"><tr><td>600</td><td>▲ ▼</td></tr></table>	600	▲ ▼	<input type="checkbox"/>	do not reduce		<input type="checkbox"/>	all or none		<input type="checkbox"/>	deferred settlement date before _____ date after _____		<input type="checkbox"/>	Other security, if any, to be provided at settlement _____	
<input type="checkbox"/>	Minimum quantity	<table border="1"><tr><td>600</td><td>▲ ▼</td></tr></table>	600	▲ ▼														
600	▲ ▼																	
<input type="checkbox"/>	do not reduce																	
<input type="checkbox"/>	all or none																	
<input type="checkbox"/>	deferred settlement date before _____ date after _____																	
<input type="checkbox"/>	Other security, if any, to be provided at settlement _____																	
531																		

FIG. 5C

DIVIDEND REINVESTMENT (FOR NEW STOCK)

532 ☐ yes, new stock must have a dividend reinvestment program
☐ no, new stock must not have had a dividend reinvestment program
☐ accept new stock with or without a dividend reinvestment program

TYPE OF BARTER

534 ☐ direct barter only (fee amount anticipated to be _____)
☐ if direct barter not available, then barter with web site (fee amount anticipated to be _____)

DESIRED ITEM

Security 535 Industry 536

☐ Himmelstein Option for stock
☐ Stock
☐ Cash
537 ☐ Web barter dollars

MARKET DATA FOR AET

Current stock trading price as of 02/15/1999 at time 10:45 am is \$ 47.50.
538

FIG. 5D

VALUE	\$		per share
		▲▼	
OR		540	
		541	
<input type="checkbox"/>	If stock or Himmelstein Option, barter at current stock trading price		
<input type="checkbox"/>	plus		
Value	\$		▲▼
OR			
Percent	%		▲▼
<input type="checkbox"/>	minus		
Value	\$		▲▼
OR			
Percent	%		▲▼

FIG. 5E

542 Your total barter amount is (anticipated to be) _____ for new stock.
Note: your value price is "X" percentage/dollar amount less/more than
current stock trading price.

544 Note: Ratio of stock to stock trading price divided by new stock to stock trading
price is "XX.XX"

546 System will re-list order and list terms and conditions and ask if you want to continue
must click on the continue/agree icon

548 549

FIG. 5F

AVAILABLE BARTER ORDERS

NOTE: CLICK ON ORDER # IF CHOOSE TO DO BARTER

IF MORE THAN ONE SELECTION, CLICK ON SEQUENTIAL PREFERENCE

610

			RATIO TO STOCK VALUE		# OF	BARTER	PRICE FLUCTUATE WITH		SPECIAL		
ORDER #	SYMBOL	PRICE	TRADING PRICE	RATIO	SHARES	AMOUNT	STOCK	TRADING PRICE	CONDITIONS	TIMING	DIVIDEND
1)	1000526	IBM	115	1.00	1.0200	120	\$13,800.00	YES	NONE	1	YES
2)	9843566	IBM	115 ^{1/16}	.9995	1.0194	40	\$4,602.50	NO	MINIMUM 40	2	NO
3)	1043442	IBM	115 ^{11/16}	.9941	1.0139	100	\$11,568.75	YES	AFTER 2/01/00	1	YES
4)									BEFORE INDEFINITE SECURITY AT SETTLEMENT=0		

	ORDER #	# OF SHARES GIVING	PRICE OF GIVING ITEM	# OF SHARES RECEIVING	PRICE OF RECEIVING ITEM	BARTER AMOUNT
1)						
2)						
3)						
4)						
5)						
TOT:						

622 AMOUNT OF BARTER LEFT	626 TIME REMAINING
RESIDUAL AMOUNT LEFT OVER	<input type="checkbox"/> HOLD IN ESCROW <input type="checkbox"/> DONATE IT <input type="checkbox"/> PURCHASE OTHER STOCK

620

624

FIG. 6

631
CLEAR

632
CHANGE
BARTER ORDER

633
FINALIZE
TRANSACTION

634
FINALIZE TRANSACTION
BUT DISPLAY MORE
OPTIONS

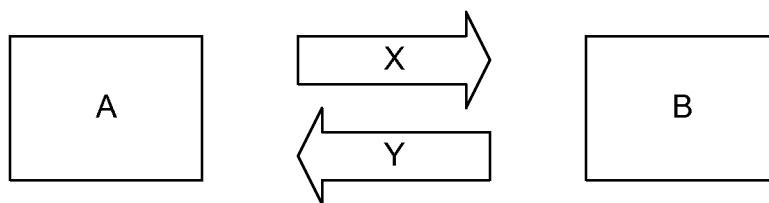


FIG. 7A



FIG. 7B

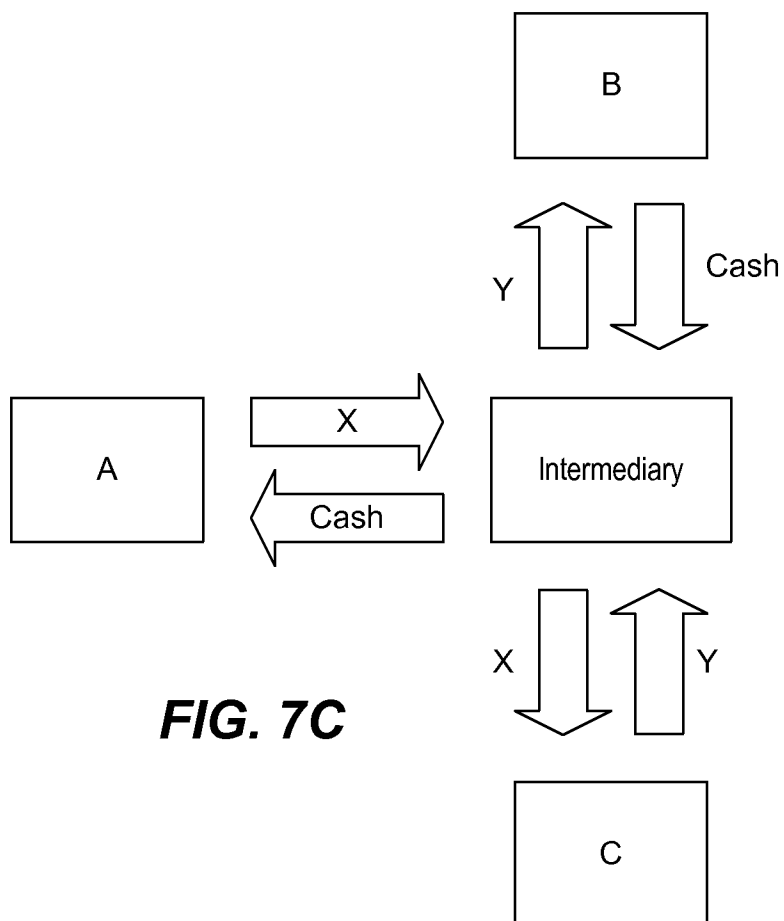


FIG. 7C

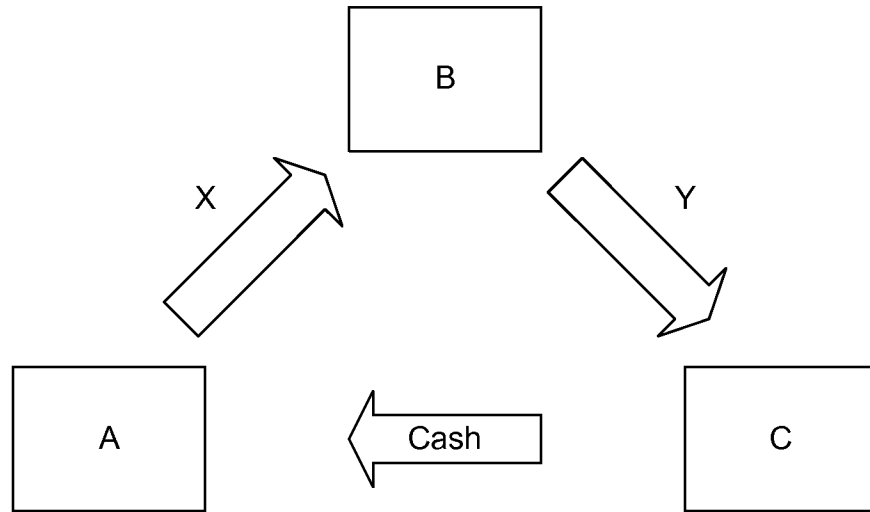


FIG. 7D

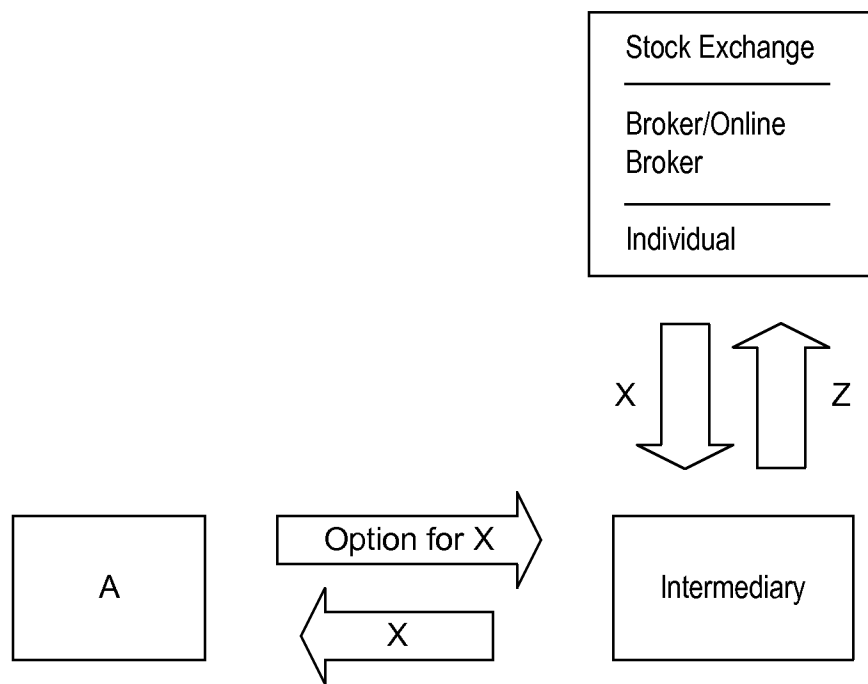


FIG. 7E

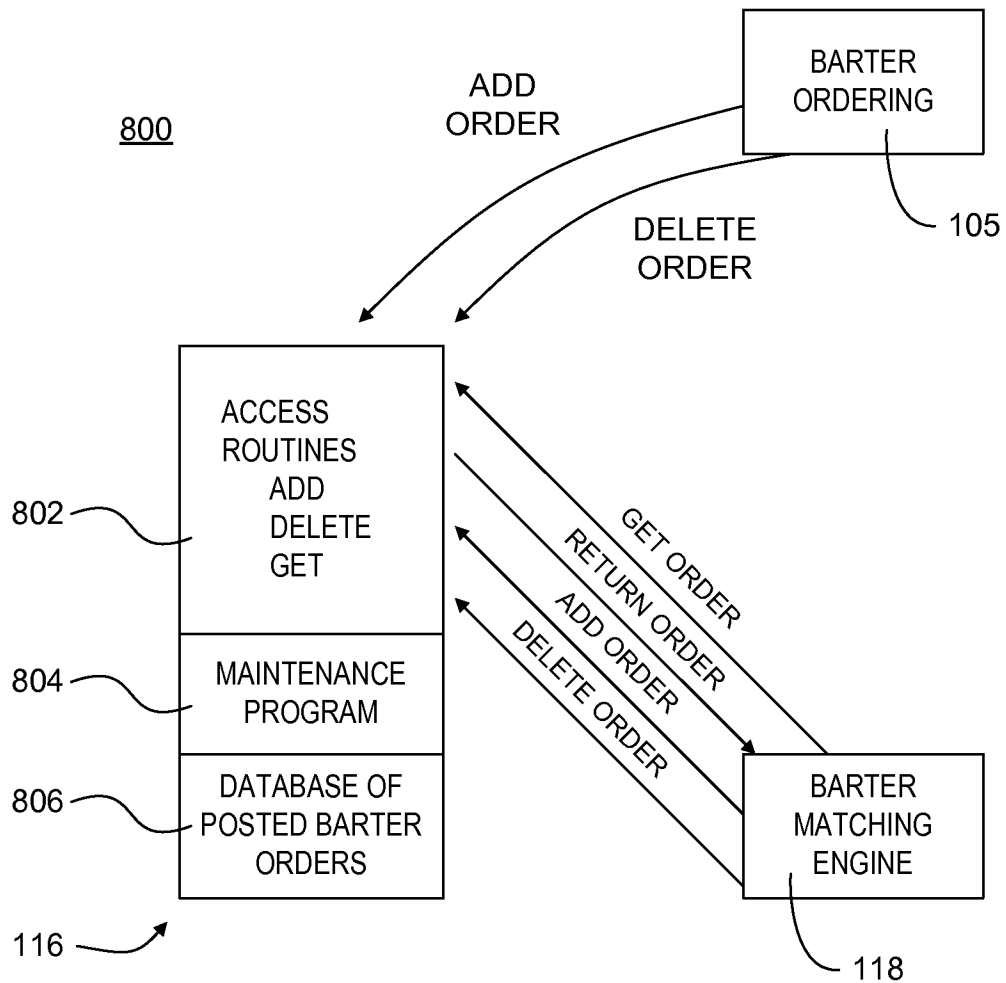


FIG. 8

FIG. 9A

FIG. 9AA **FIG. 9AB**

	Class/ Type	Item/ Identification	Amount	Market Value	Bid/Strike Price	Expiration Settlement/Date	
1	Stock	Symbol or Name	# Shares	\$	N/A	N/A	
2	Currency	US or Foreign	X	US\$	N/A	N/A	
3	Bonds	Issuer	X	\$	N/A	N/A	
4	Options	Z	N	\$	+/- \$	MMDDYY	
5	Government Bond	Treasury Notes, Bonds or Bills	X	\$	+/- \$	N/A	
6	Futures	Symbol or Name	Measurement Quantity	\$	N/A	MMDDYY	
7	Annuities	Issuer	X	\$	N/A	N/A	
8	CD's	Issuer	X	\$	N/A	N/A	
9	Web Barter Dollars	IOU	X	\$	+/- \$	MMDDYY	

Z = Any security

X = Foreign or domestic currency

FIG. 9AA

Replacement Sheet
US Appl. No. 10/086,116
Attorney Docket No.: 69174-5
18 / 83

	Barter Value	Interest Rate/ Current Yield	Due/Maturity Date	Other	Barter/Settlement Date Open/Close
	\$ or specific Relationship to Market value	N/A	N/A	Dividend?	MMDDYY
					MMDDYY
	US\$ or specific Relationship to Market value	N/A	N/A	Par Discount Premium	MMDDYY
					MMDDYY
	\$ or specific Relationship to Market value	Y% Interest rate	MMDDYY	N/A	MMDDYY
					MMDDYY
	\$ or specific Relationship to Market value	N/A	N/A	N/A	MMDDYY
					MMDDYY
	\$ or specific Relationship to Market value	Y% yield rate	MMDDYY	N/A	MMDDYY
					MMDDYY
	\$ or specific Relationship to Market value	N/A	N/A	N/A	MMDDYY
					MMDDYY
	\$ or specific Relationship to Market value	Y% Interest rate	MMDDYY	Fixed or Variable Interest Rate	MMDDYY
					MMDDYY
	\$ or specific Relationship to Market value	Y% Interest rate	MMDDYY	Compound Interest?	MMDDYY
					MMDDYY
	\$ or specific Relationship to Market value	Y% Interest rate	MMDDYY	Dividend? Par, Discount, Premium Fixed or Variable Interest Compound Interest?	MMDDYY
					MMDDYY

Y = Interest rate or current yield in percentage

N = Quantity of options

FIG. 9AB

FIG. 9B

FIG. 9BA	FIG. 9BB
-----------------	-----------------

	Class/ Type	Item/ Identification	Amount	Market Value	Bid/Strike Price	Expiration Settlement/Date	
1	Stock	AOL	100 Shares	\$ 10,900.00	N/A	N/A	
2	Currency	Canadian \$	5,000 CN\$	\$ 3,453.04	N/A	N/A	
3	Bonds	Mirage	25,000.00	\$24,750.00	N/A	N/A	
4	Options	IBM	12 Options	\$ 122,400.00	\$ 102.00	30-Nov-99	
5	T-Bills	US Government	\$10,000.00	\$ 10,000.00	\$ 101.00	N/A	
6	Futures	Gold	10 troy oz	\$ 3,157.50	N/A	30-Nov-99	
7	Annuity	TransAmerica	\$100,000.00	\$ 100,000.00	N/A	N/A	
8	CD's	SunWest Bank	\$50,000.00	\$50,000.00	N/A	N/A	
9	Web Barter Dollars	IOU	\$25,000.00	\$25,000.00	A	B	

A = Could have Bid Strike Price if Web Barter \$ are from Options or Government Bonds + CD depending on terms and conditions in barter transactions

B = Could have Expiration Date if Web Barter \$ are from Options or Futures depending on terms and conditions in barter transactions

FIG. 9BA

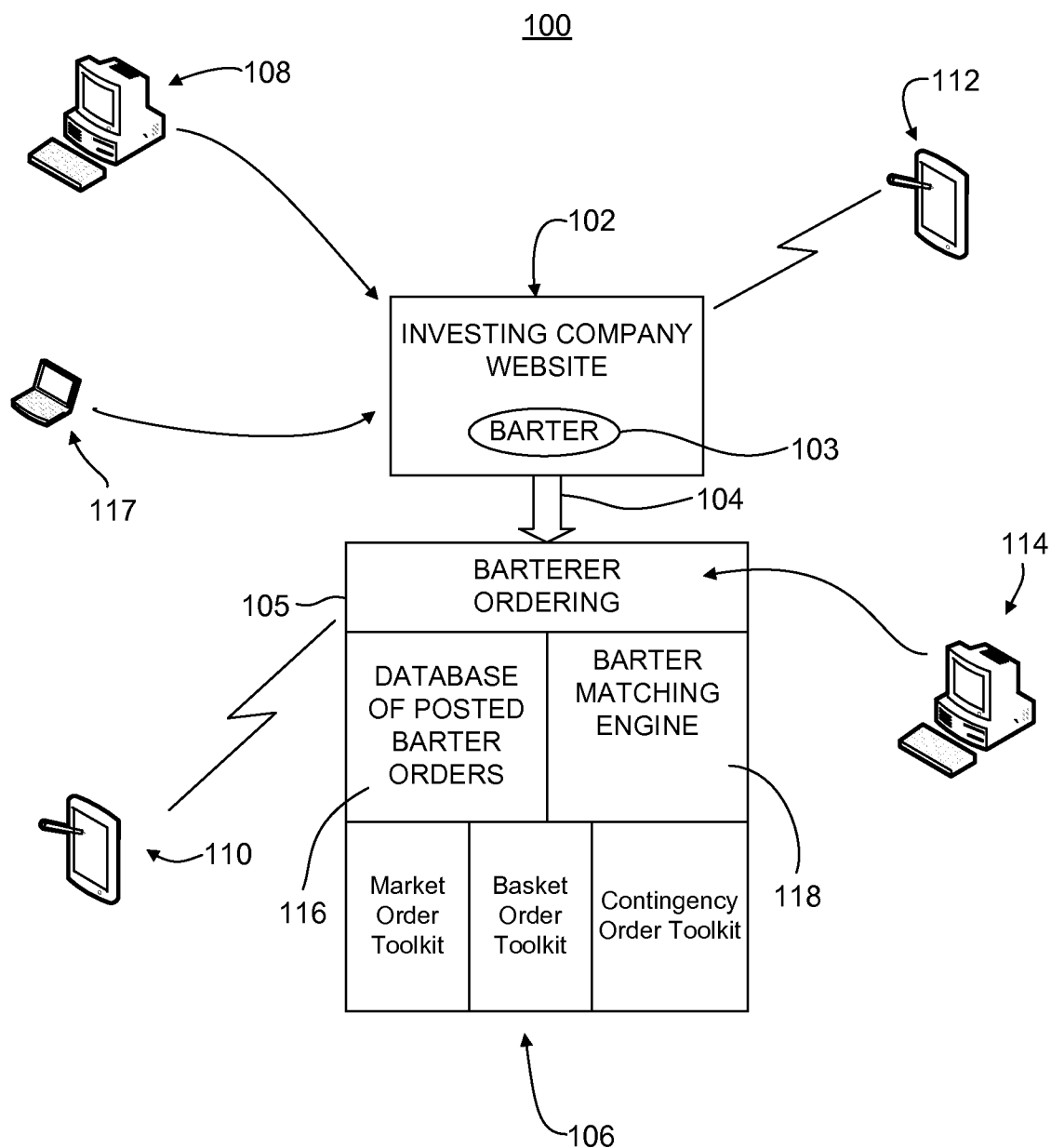
Replacement Sheet
US Appl. No. 10/086,116
Attorney Docket No.: 69174-5
20 / 83

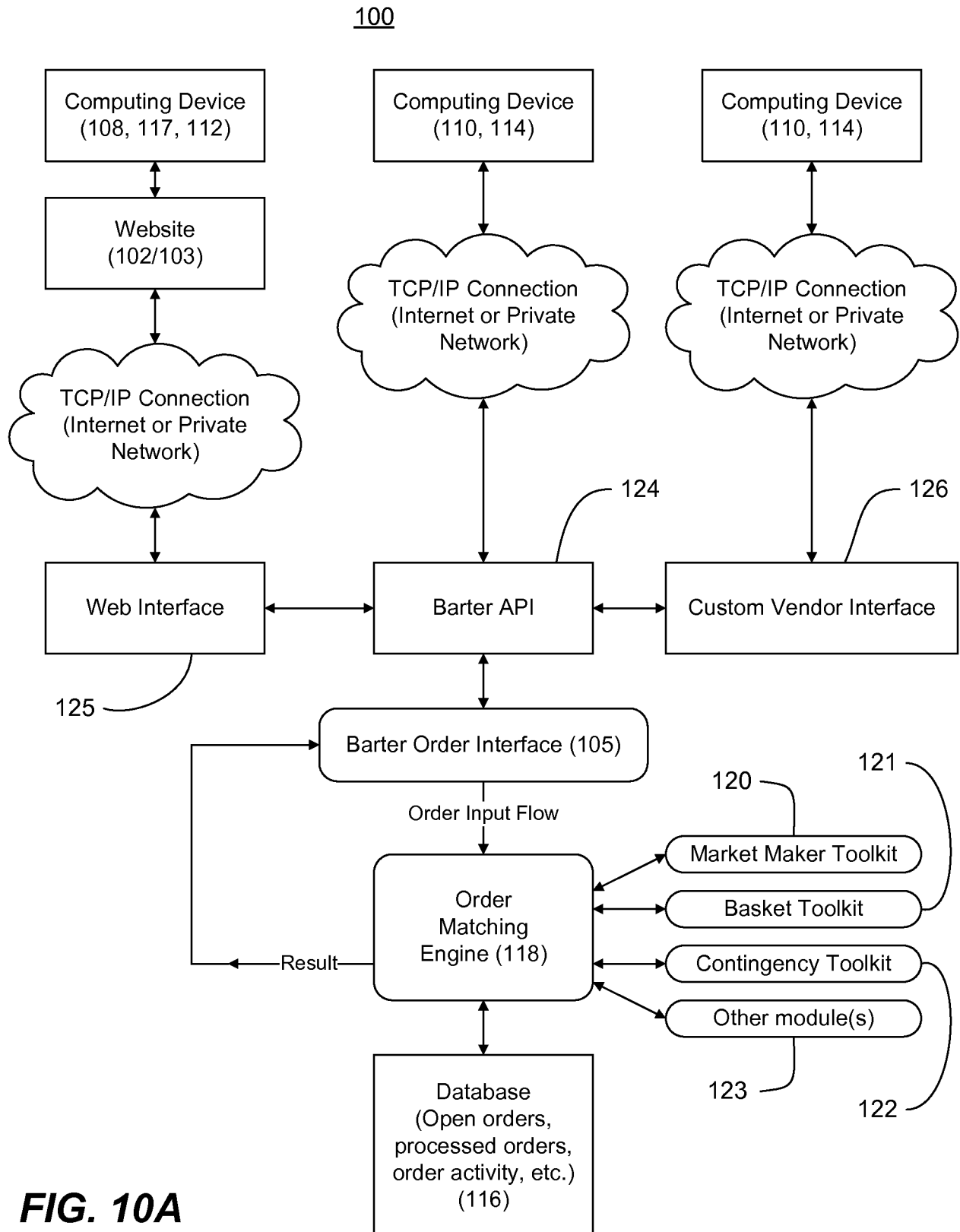
	Barter Value	Interest Rate/ Current Yield	Due/Maturity Date	Other	Barter/Settlement Date Open/Close
	\$ 10,750.00	N/A	N/A	Dividend?	01-FEB-01/ 29-FEB-01
	\$ 3,448.28	N/A	N/A	N/A	02-JAN-00/ 02-JAN-00
	\$ 24,900.00	8.50%	1-MAR-15	Par, Discount, Premium	24-DEC-03/ 28-DEC-04
	\$ 12,840.00	N/A	N/A	N/A	4-OCT-99/ 4-NOV-99
	\$ 9,800.00	4.93%	15-Jun-00	N/A	OPEN/ 15-DEC-99
	\$ 3,000.00	N/A	N/A	N/A	OPEN/ 31-OCT-99
	\$ 105,000.00	10.50%	10-Jun-06	Fixed or Variable Interest	02-JAN-02/ 12-JAN-02
	\$ 49,000.00	4.14%	10-May-00	Compound Interest?	12-DEC-99/ 12-DEC-99
	\$ 24,500.00	C	D	Dividend? Par, Discount, Premium Fixed or Variable Interest Compound Interest?	OPEN/ 15-JUN-01

C = Could have Yield or Interest Rate if Web Barter \$ are from Bonds, Government Bonds, Annuities or CD's depending on terms and conditions in barter transactions

D = Could have Maturity Date if Web Barter \$ are from Bonds, Government Bonds, Annuities or CD's depending on terms and conditions in barter transactions

FIG. 9BB





Request Barter Order Trade Prices

[Symbol Lookup](#) [View Portfolio](#)

Symbol Quantity
(For each leg, specify shares or dollars, but not both.)

SELL HD 2000 shares \$
SIDE

☐ check if Short Sale

BUY IBM 1000 shares \$
SIDE

[Get Quote](#) [Clear](#) [Cancel](#) [Help](#)

FIG. 11

Response to User Trade Request

[Definitions](#) [Trade Help](#) [Make Another Request](#) [Save](#) [Close](#)

SELL 2000 HD --vs-- BUY 1000 IBM						
National Best Bid and Offer						
	LT	Chg	Bid	Ask	Size	
HD	54 1/8	+ 1/2	54 1/8	54 3/16	10 x 10	
IBM	100 1/8	+1 1/4	100	100 1/4	20 x 10	
Unit NBBO	-\$406.25	+ 1/8	-\$418.75	-\$400.00	10 x 10	
Your Unit Bid				-\$412.50		
				Spread		
Total NBBO	-\$8,125	+\$250	-\$8,375	-\$8,000	\$375	
Your Total Bid				-\$8,250	\$125	
Dollars Saved					\$250	

1000	-418.75	NBBO Bid		
2000	-412.50	Your Bid		
Sell-side Shares	Unit Price	Order Type	You Save	
1000	-407.50	System	\$75.00	Trade
500	-403.75	System	\$18.75	Trade
500	-400.94	System	\$ 4.69	Trade
2000	-400.00	System		Trade
1000	-400.00	NBBO		Trade

FIG. 12

**Response to User Trade Request:
Definitions**

NBBO is National Best Bid and Offer. These prices and trade sizes occur on the NYSE, Nasdaq, and other exchanges and Electronic Communications Networks (ECNs).

Although NBBO prices and sizes are set outside of the BarterSecurities system, this user can trade on them from the BarterSecurities "Response to User Trade Request" screen.

Unit Prices are calculated per 100 shares of the requested sell side. If the user request is to Sell 2000 shs HON and buy 1000 shs IBM, the Unit Trade is to sell 100 shs HON and buy 50 shs IBM.

FIG. 13A

**Response to User Trade Request:
National Best Bid and Offer Screen**

Your order, or your Request for Trade Prices, is deemed to fall on the bid side of the Barter market. The NBBO bid price is on the same side of the market as your order. The NBBO offer price is on the contraside of the market as your order, and you can trade against it if no better offer exists.

The NBBO unit bid price corresponding to your order/request is calculated by trading the sell-side of your order on the NBBO bid price and trading the buy-side of your order on the NBBO ask price. Likewise, The NBBO unit offer price for your order is calculated by trading the sell-side of the Barter on the NBBO offer price and trading the buy-side of the Barter on the NBBO bid price. Positive unit prices mean that you PAY that price to execute the order. Negative unit prices mean that you RECEIVE the price to execute the order.

Total NBBO prices are the product of the unit prices and the sell-side quantity of your order. Again, positive prices mean that you PAY that price to execute the order. Negative prices mean that you RECEIVE that price to execute the order.

If you have specified a limit price for your Barter order, then your unit bid price and total bid price are shown in the National Best Bid and Offer box. If your unit bid price exceeds the NBBO unit bid, then your order is said to be hot. The BarterSecurities system attempts to locate the best offer only for hot bids. Tip: If your bid is not hot but you want BarterSecurities to show you the best offers, then use the Request Barter Order Trade Prices screen, which does not allow you to enter a limit price.

Dollars Saved is the amount that you would save by executing your order at your limit price relative to the NBBO price. If the NBBO size is not large enough to complete your order, then savings are computed relative to "next best" prices that marketmakers are showing. Click Trade Help to learn more about using the BarterSecurities system to save money relative to the NBBO market and/or to execute larger size than is available on the NBBO market.

FIG. 13B

**Response to User Trade Request:
Trade Help**

Suppose that you have made a request to sell 2000 shares HON vs. buying 1000 shares IBM and that the right half of the "Response to User Trade Request" screen shows the bids and offers below.

1000	-418.75	NBBO Bid		
2000	-412.50	Your Bid		
Sell-side Shares	Unit Price	Order Type	You Save	
1000	-407.50	System	\$75.00	<u>Trade</u>
500	-403.75	System	\$18.75	<u>Trade</u>
500	-400.94	System	\$ 4.69	<u>Trade</u>
2000	-400.00	System		<u>Trade</u>
1000	-400.00	NBBO		<u>Trade</u>

The top of the screen, above the column labels, shows the bid side for your order and the bottom of the screen (below column labels) shows offers. Your request is always expressed as a bid (see Definitions) and, as such, shows up on the top part of the screen along with the NBBO bid. Also, the screen may reflect bids that are internal to the BarterSecurities system (in addition to your order.) All bids and offers are expressed in terms of a "Unit Price", or per 100 shares of the sell-side of the Barter Order.

FIG. 14A

In the example above, your bid is better (i.e., you're willing to receive fewer dollars) than the NBBO bid. This means your bid is "hot" and may be executed at any time from within the BarterSecurities system. If your bid price is below the NBBO bid, you will have to proactively trade on an existing offer (at a less favorable price than your current unit bid), or wait for the NBBO bid to drop before your order has a chance of being executed.

In the lower half of the screen the NBBO unit offer price is shown along with offers that have been generated by the system. All of the system offers will either (1) save you money relative to the NBBO offer because the unit price of execution is more favorable or (2) allow you to trade a larger size (up to your request size) than the NBBO market.

If you click on the word "Trade" on an offer line, the system attempts to fill the requested trade size at the most favorable price to the trader up to the price level on the order line that was clicked.

For example, if you click "Trade" on the first offer line: "1000 / -407.50", the system will attempt to trade 1/2 of the requested barter (i.e., 1000 shares available on the sell-side out of the 2000 requested) at the unit price of -\$407.50, meaning that you RECEIVE a total of \$4075.00.

If, instead, you click on the third offer line: "500 / -400.94", the system will attempt to fill the first tranche of the requested trade size (1000 HON vs. 500 IBM) at the most favorable unit price to the trader of -\$407.50, followed by another 500 HON vs. 250 IBM at -\$403.75, followed by another 500 HON vs. 250 IBM at -\$400.94. Overall, you would have saved \$98.45 relative to trading on NBBO prices, while at the same time filling all of your order, rather than the half which was available at NBBO prices.

Note that if you had clicked on the fourth offer line, "2000 / -\$400.00" you would have gotten the same result as in the previous example. This is because the system attempts to trade only enough size to fill the initial trade request (2000 shares on the sell-side), and only at the most favorable prices for the user.

FIG. 14B

Order Entry	
Account <input type="text" value="XX-XXX-XXXX"/>	
Symbol <input type="text"/>	Buy Side <input type="text"/> Sell Side <input type="text"/> <input type="checkbox"/> Check if Short Sale
<input type="button" value="Lookup"/>	
Amount	
Shares <input type="text"/>	<input type="text"/>
or	
Dollars \$ <input type="text"/>	\$ <input type="text"/>
Action	
<input type="text" value="Execution Type"/> (Select One) ▼	
Pay no more than \$ <input type="text"/> before commissions.	
Receive at least \$ <input type="text"/> before commissions.	
OR, compute pay/receive by entering equivalent limit prices:	
Limit \$ <input type="text"/>	\$ <input type="text"/>
Execute Dual Market Order only if and when:	
<input type="radio"/> Buy side price touches \$ <input type="text"/>	
<input type="radio"/> Sell side price touches \$ <input type="text"/>	
Satisfy Pay/Receive Limit only if and when:	
<input type="radio"/> Buy side trades >= \$ <input type="text"/>	
<input type="radio"/> Buy side trades <= \$ <input type="text"/>	
<input type="radio"/> Sell side trades >= \$ <input type="text"/>	
<input type="radio"/> Sell side trades <= \$ <input type="text"/>	
Timing and Options	
<input type="text" value="Day Only"/> ▼	
<input type="checkbox"/> Fill or Kill	<input type="checkbox"/> All or None
<input type="checkbox"/> Immediate or Cancel	<input type="checkbox"/> Do not Reduce
<input type="button" value="Submit Now"/>	<input type="button" value="Save"/> <input type="button" value="Cancel"/>

Execution Types:

Market

Pay/Receive Limit

Advanced Market

Advanced Pay/Receive Limit

FIG. 15

Automatic Bid/Offer Responses		
Rules: <div>great_hedge</div> <div>*default *show_manual_1 *show_manual_2 illiquid_one small_cap_both great_hedge small_debit</div> <div>NewDelete</div>	Conditions: <div>Variable...Operator...</div> <div>Delta <= 10% SICmatch = 2 VOLmin >= 2 both_symlist = 1-4</div> <div>AddEditRemove</div>	Price and Size: <div>Price Adjustment NBBO + 0%</div> <div>Size Offered <input type="radio"/> Shares <input type="radio"/> Dollars <input type="checkbox"/> Add NBBO Size</div> <div>Tier 1: price: NBBO - 25% size: NBBO Tier 2: price: NBBO size: NBBO + 500 shs Tier 3: price: NBBO + 10% size: \$25,000</div> <div>AddEditRemove</div>
<div>OKCancelHelp</div>		

FIG. 16

Symbol Lists

Enter List Name:

1. Fred

2. John

3. Ralph

4. Jennifer

New

Edit

Delete

Enter Symbol:

IBM

SUNW

HWP

DELL

CPQ

Add

Remove

OK

Cancel

FIG. 17

Automatic Bid/Offer Responses: Entering Rules

A Rule is a statement of how and when to respond to retail Barter Orders. Enter a new Rule name or click on an existing rule name to create or edit the rule's Conditions and Automatic Offers. To create a Condition combine a variable name, an operator, and a critical value. Click [here](#) to see variable definitions and allowable value ranges. For example, to define an order with relatively little net market exposure, construct the equation:

Delta	<=	10%
-------	----	-----

Marketmakers can set up Automatic Offers that comprise any number of tiers, each of which is expressed in terms of the current NBBO prices and sizes.

Consider the following example;

1. Retail trader wants to Buy 1000 ABC, Sell 2000 XYZ.
2. NBBO markets are

ABC 100 / 100.20 20 x 20

XYZ 45 / 45.15 10 x 5

3. For Rule 1, the marketmaker constructs an Automatic Offer by setting the Tier 1 Value Increment to -25% and the Tier 1 Size Increment to +25000.

Bid to offer, the total cost to the retail trader would be \$10,200 ($1000 \times 100.20 - 2000 \times 45$). The dollar size of the bid/ask spread is \$500 ($1000 \times 0.20 + 2000 \times 0.15$). If the Barter Order satisfied the conditions of Rule 1, then the system would reduce the NBBO spread by 25%, or \$125 and offer the trade at \$10,075. On the NBBO sizes only half of the trade can be completed because only half of the XYZ is bid for. The system would show the marketmaker bidding for \$25000 more of XYZ, or over 500 shares. Therefore, the system would show that the marketmaker is willing to complete 3/4 of the trade at the Tier 1 price. Furthermore, the marketmaker's Tier 2 price/size might allow the system to show that the final 25% of the trade could be completed at a higher price for the retail trader.

Certain rule names cannot be modified by the user. These rule names are preceded by an asterisk in the name list. The *default rule is always in existence but, of course, the marketmaker can set the conditions of the rule so that it is never active. The marketmaker can set up any number of rules named 'show_manual_n', where n is ordered by the system. These rules do not dictate automatic offers, but rather tell the system when to allow the marketmaker to respond manually to a bid or a trade request. For example, the marketmaker may want to respond manually whenever an order amount exceeds \$200,000, or when both sides of the trade fall within user-defined symbols lists.

FIG. 18

Automatic Bid/Offer Responses: Definitions of Variables and Allowable Value Ranges		
<u>examples</u>		
Variable	Definition	Range (units)
Delta	$\text{abs}(\$long - \$short) / (\max(\$long, \$short))$	0-100%
SICmatch	Number of SIC code digits of buy and sell that match, starting from left.	0,1,2,3,4
MCAPmax	Market Cap of larger-cap stock	(\$bil)
MCAPmin	Market Cap of smaller-cap stock	
VOLmax	Avg Daily \$-volume traded, last 30 days, of more-active stock.	(\$mil)
VOLmin	Avg Daily \$-volume traded, last 30 days, of less-active stock.	
BA_Debit	Debit value of bid/ask spread of Barter Order on NYSE and Nasdaq inside prices.	(Dollars)
either_symlist	Group of user-defined symbol lists that contains at least one trade symbols.	1, . . . , n
both_symlist	Group of user-defined symbol lists that contains both trade symbols.	e.g., 1,4,6-8

FIG. 19

**Automatic Bid/Offer Responses:
Examples of Variable Usage**

'Delta' measures the dollar amount of exposure of the Barter Order. If the retail trader's buy side debit is \$100,000 and the sell side credit is \$75,000, the debit is
$$25\% = |100000 - 75000| / \max(100000, 75000).$$

'SICmatch' shows how industry-related two stocks are. Matched digits are counted from the left until a match fails, after which remaining digits do not count.

SIC #1	SIC #2	SICmatch
4013	4031	2
2631	4031	0.

MCAPmax and MCAPmin measure market capitalization of the bigger and smaller stock, respectively. To ensure that both stocks' market cap exceeds \$1 billion, enter "MCAPmin >= 1". To ensure that at least one stock's market cap exceeds \$10 billion, enter "MCAPmax >= 10".

VOLmax and VOLmin measure the dollar volume of the more- and less-active stock, respectively. To ensure that both stocks trade at least \$2 million per day, on average, enter "VOLmin >= 2". To identify trades in which neither stock trades more than \$2 million per day, on average, enter "VOLmax <=2".

BA_Debit is the dollar width of a Barter Order on the NBBO market. If a retail trader wishes to buy 100 ABC on the NBBO market 50-50.25 and sell 300 XYZ on the NBBO market 20-20.10, then the dollar size of the spread is \$55, or $100 \times 0.25 + 300 \times 0.10$.

'either_symlist' and 'both_symlist' allow the marketmaker to identify whether stock symbols fall in marketmaker-created lists. Suppose the marketmaker sets up three lists:

List 1: IBM, CPQ, DELL, SUNW, HWP

List 2: GM, F, DCX

List 3: ADCT, ADBE, AMGN, AMAT, AMCC.

To ensure that at least one of the Barter Order symbols falls in lists 1 or 3, enter "either_symlist = 1,3". To ensure that both Barter Order symbols fall in any of the lists, enter "both_symlist = 1-3".

FIG. 20

Define Order Contingencies					
<p>Name:</p> <p>Techs_up_2</p> <p>SPX_up_for_day</p> <p>NDX_crosses_mavg</p> <p>Techs_up_2</p> <p>star_on_low</p> <p>New Delete</p>	<p>Conditions:</p> <table border="1"><tr><td>Select Variable ...</td><td>Arithmetic Operator ...</td><td>Comparison Operator ...</td><td>Security Symbol ...</td></tr></table> <p>[SUNW]Price >= 1.02*[SUNW]Cprice(D-1)</p> <p>[SUNW]Price >= 1.02*[SUNW]Cprice(D-1)</p> <p>[CSCO]Price >= 1.02*[CSCO]Cprice(D-1)</p> <p>[#]Price >= 1.02*[#]Cprice(D-1)</p> <p>Add Edit Remove</p>	Select Variable ...	Arithmetic Operator ...	Comparison Operator ...	Security Symbol ...
Select Variable ...	Arithmetic Operator ...	Comparison Operator ...	Security Symbol ...		
<p>OK Cancel Help</p>					

FIG. 21

Defining Contingent Orders

An order contingency is a set of user-defined conditions that must be satisfied before a "primary" order (i.e., symbol, buy/sell, quantity, market/limit) is sent, and by giving this group of conditions a label, or name, that will be used when the primary order is created.

To create and name a new order contingency enter the new name in the top field under "Name" and click **New**. The name will be entered in the lower field along with the names of existing order contingencies. To delete an existing order contingency, including both its name and conditions, highlight the name in the lower field and click **Delete**. To enter the conditions that are associated with an order contingency, highlight the name in the lower field and begin typing conditions in the top field under "Conditions".

Conditions of an order contingency are used to describe market characteristics. The system sends an order only when all of the conditions are satisfied. (To send an order using "or" logic, create two or more primary orders in the Send Contingent Order window, and apply a different Contingency Name to each primary order.) A Condition may consist of variables, arithmetic operators, numerical constants, security symbols, and a comparison operator, such as "greater than or equal to". Variables can be pre-defined by the system and include large numbers of fundamental, technical, historical, and descriptive characteristics. These variables and their mnemonic abbreviations are accessed through a pop-up screen in response to clicking the **Select Variable** button. Examples of variables are "one-year-ago earnings per share", "10-day moving average", "percent change in price over last 30 days", and "shares outstanding". Users can create new variables by combining system variables with arithmetic operators, as in [Book Value / Shares Outstanding]. Thus, user-defined expressions can be created and tested against user-defined benchmarks, as in the condition, [Book Value / Shares Outstanding <= Current Price]. Click here to learn [variable syntax](#).

To create a new condition, type the condition in the top field under "Conditions" and click **Add**. To modify a condition, highlight the condition in the lower field and click **Edit**. To delete a condition, highlight it in the lower field and click **Remove**.

To save the changes that have been made, click **OK**. To ignore the changes that have been made since the last Save, click **Cancel**.

FIG. 22

Defining Contingent Orders: Variable Syntax

In the examples below, *variable* refers to any system or user-defined variable, such as "Price" for the intraday last traded price of a security.

[SYM]*variable* is the variable for the security whose symbol is SYM. For example, [CSCO]Cprice is yesterday's closing price of Cisco.

[#] is a special symbol which denotes the security for which an order will be sent. For example, suppose that within a portfolio of ten stocks, each stock is to be sold using a market order when the stock has risen 2% from the previous close. By using the [#] symbol, only one contingency need be defined in the Define Order Contingencies screen, and the same condition can be applied to the ten different stocks in the "Send Contingent Orders" screen.

Note that when entering a limit price that is dependent on the market picture at the time the order is delivered, the [#] symbol may be omitted, since the symbol of the intended security is already given in the Send Contingent Order screen

variable(D-n) is the variable measured back n trading days. For example, CPrice(D-3) is a closing price three trading sessions ago. If "n" is not entered, it is assumed to be zero. For certain variables whose default is daily measurement, the letter D may be excluded. For example, CPrice(-5) is the closing price 5 trading days ago.

For certain fundamental variables, *variable*(Q-n) and *variable*(Y-n) are the variable measured back n quarters and n years, respectively. For example, EPS(Q-1) is "Earnings per Share" measured 1 quarter ago. EPS(Q) is the most recent quarterly earnings per share, whereas EPS(Y) is the earnings per share for the most recent fiscal year.

{hh:mm+n} is an order suspension qualifier which is entered at the end of a condition and which holds the contingent order until the time indicated on the day indicated by n. For example, {15:45+1} holds an order without sending it to the market until 3:45pm on the trading day after today. If n is not entered, it is assumed to be zero. When passage of time causes the suspension qualifier to be irrelevant, an order is sent to the market only if the remaining market contingencies are satisfied.

FIG. 23

Send Contingent Order	
Contingency Name:	<input type="text" value="Techs_up_2"/>
Symbol:	<input type="text" value="MSFT"/>
Action:	<input type="text" value="BUY"/> ▼
Quantity:	<input type="text" value="1,000"/>
Execution Type:	
<input type="radio"/> Market	
<input type="radio"/> Fixed Limit:	<input type="text"/>
<input checked="" type="radio"/> Dependent Limit:	<input type="text" value="Ask"/>
<input type="button" value="Send"/>	<input type="button" value="Cancel"/> <input type="button" value="Help"/>

FIG. 24

Sending Contingent Orders
<p>A contingent order is one that will not be sent until one or more user-defined conditions are satisfied. Furthermore, the limit price of the order, rather than being a fixed price, may be dependent on the market picture at the time that the order is sent. For example, the "dependent" limit price might be the current ask price of the stock at the time the order is sent. Or, the dependent limit price might be the most recent closing price of a stock, plus the product of [the change in the SPX index for the day] and [the beta of the stock relative to the SPX index.] To learn about the syntax that can be used to enter contingency conditions and dependent limit prices, refer to the help screen on variable syntax.</p> <p>In order to apply contingent orders, a set of user-defined conditions must be defined in the Define Order Contingency screen and given a name that is used in the first field of the Send Contingent Order screen.</p>

FIG. 25

Define Baskets

Enter Basket Name:

BigCap_Healthcare
Buy Value
Sell_HiTech
NDX_Beta_Unity

Enter Symbol Formula:

(tech_symlist_1 U technical_filter_3)
∩ Portfolio_4

No. of Symbols in Basket:

Select Quantity Methodology: ▼

☐ Amount per Symbol: USD ▼

☐ Total Basket Amount: USD ▼

Market Index or Factor: ▼

☐ Exposure per Symbol: USD ▼

☐ Total Basket Amount: USD ▼

View Symbols, Quantities

IVAX	\$100,000
ABX	\$100,000
ABS	\$100,000
BA	\$100,000
BMJ	\$100,000
CSCO	\$100,000
DF	\$100,000
EC	\$100,000
IVAX	\$100,000
MCD	\$100,000
MO	\$100,000
MRK	\$100,000
MU	\$100,000
NOC	\$100,000
PCG	\$100,000
SCH	\$100,000

FIG. 26

Select Quantity Methodology: ▼
Equal Currency Amounts
Equal Beta or Factor Exposure
Target Exposure . . .
Advanced . . .

FIG. 27

Define Baskets Screen

A basket of securities ("basket") is defined to be at least two different securities, grouped in any combination of descriptions or quantities. The "Define Baskets" tool kit allows the user to identify and define baskets according to market-, portfolio-, or general risk characteristics, as well as quantity specifications.

The Define Baskets tool kit is partitioned into four sections: these are

- o Enter Basket Name,
- o Enter Symbol Formula,
- o Select Quantity Methodology, and
- o View Symbols, Quantities.

Enter Basket Name

To create and name a new basket, enter the new name in the top field and click **New**. The name will be entered in the lower field along with the names of existing baskets. To define or edit the characteristics of a basket, including symbols and quantities, highlight its name in the lower field and enter or edit the symbol formula. To rename a basket, highlight its name, modify the name in the upper field, and click **Rename**. To delete an existing basket, including both its name and characteristics, highlight the name in the lower field and click **Remove**.

Enter Symbol Formula

In order to use this section, you must understand the Fundamental and Technical Filters window and the Symbol Lists window.

Symbol formulas are created by taking unions and intersections of user-defined symbol lists and user-defined filters. The union and intersection operators apply to only two lists at a time. Using parentheses, such expressions can be combined to any depth. The union of two sets of symbols includes all of the symbols that are in either of the two sets. The intersection of two sets of symbols includes all of the symbols that are in both sets. Once the symbol formula is entered and the user clicks on another part of the window, the number of symbols in the resulting basket is shown below the formula window.

FIG. 28A

Select Quantity Methodology

Prior to sending a basket order, quantities (preferably in currency amounts rather than in shares) must be attached to each symbol in the basket. The pull-down **Select Quantity Methodology** button reveals four ways of attaching quantities to symbols. These are:

- o Equal Currency Amounts,
- o Equal Beta or Factor Exposure,
- o Target Exposure, and
- o Advanced

Amounts are assumed to be in U.S. dollars unless the user chooses a different currency by way of pull-down menus. If the amount of a security is not expressed in its home currency, the system converts the expressed amount into the home currency using current FX spot rates at the time a basket order is sent. In the subsequent discussion, the term "dollars" is used to denote the currency that is chosen by the user.

o Equal Currency Amounts

This methodology causes the same amount of dollars or other currency to be associated with each security in the basket. After selecting this option, the user must enter either the amount of each security or the overall amount of the basket.

o Equal Beta or Factor Exposure

This methodology causes the same amount of market exposure to be associated with each security in the basket. After selecting this option, the user must enter the market index or the factor which will be used to compare the exposures of each security. For example, if the user types in or uses the pull-down menu to select SPX, then the beta of each security in the basket to the S&P 500 index is measured. When the basket is sent, the dollars of a security are chosen so that [dollars*SPX beta] are equated for each security. That is, fewer dollars of high-beta securities than of low-beta securities are sent. Moreover, the user can select certain factors (e.g., value, growth, current yield, etc.) to govern market exposure. When the basket is sent, dollar amounts for each security are calculated to equate the exposure to the chosen risk factor for each security in the basket.

FIG. 28B

o Target Exposure

Selecting this option causes a pop-up window to appear. The user is coached to choose a target exposure, and to identify a second asset (either another basket or a single security). When sending the basket, the dollar amount of the second asset is varied so that the original basket plus the second basket has the desired exposure. (If this is not mathematically possible, the user is alerted before the order is delivered.) For example, the user can combine a basket of high-risk technology stocks with the right amount of T-bills to produce a target amount of beta to the Nasdaq-100 index.

o Advanced

Selecting this option causes a pop-up window to appear. The user may input specific dollar amounts for each security, or may modify the result of previous methodologies (e.g., Equal Currency Amounts) for individual securities.

View Symbols, Quantities

Once the Symbol Formulas and Quantity Methodology have been chosen, the clicking the **View Symbols, Quantities** button displays the list of security symbols and corresponding quantities that are associated with the highlighted basket. To add symbols individually, type a symbol in the top left field and a quantity in the top right field under the **View Symbols, Quantities** button and click **Add Symbol**. (To add a symbol without a quantity, use the "Symbols Lists" or "Fundamental and Technical Filters" window.) To delete a symbol and its quantity from the list, highlight the symbol and click **Remove Symbol**. To modify a quantity for a symbol, highlight the symbol, then type the new quantity in the top right field under the **View Symbols, Quantities** button and click **Modify Quantity**.

FIG. 28C

Symbol Lists

Enter List Name: HiTech	Enter Symbol: HWP
1. Low_Price	IBM
2. BigCap	SUNW
3. HiTech	HWP
4. tech_symlist_1	DELL
	CPQ
<input type="button" value="New"/> <input type="button" value="Edit"/> <input type="button" value="Delete"/>	<input type="button" value="Add"/> <input type="button" value="Remove"/>
	<input type="button" value="Copy Symbols from File . . ."/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

FIG. 29

**Defining Baskets:
Symbol Lists**

This window allows the user to set up any number of symbol lists, each of which includes a set of known security symbols. To name a symbol list, enter the name in the top field under "Enter List Name:" and click **New**. The name will be entered in the lower field along with the names of existing symbol lists. To remove an existing list, including its name and corresponding security symbols, highlight the name in the lower field and click **Delete**. Highlight the name in the lower field and click **Edit** to input the symbols that make up the list.

Symbols can be added to a list that is being edited in two ways. To enter symbols individually, type a symbol in the top field on the right side of the window under "Enter Symbol:", and click **Add**. The symbol will be entered in the lower right field along with existing symbols for this list. Alternatively, an existing file of symbols can be appended to a list by clicking **Copy Symbols from File . . .** and following the pop-up directions. Use this to copy the symbols from an existing portfolio, for example. To delete a symbol from the list that is being edited, highlight the symbol and click **Remove**.

Click **OK** to save the changes that have been made, or **Cancel** to ignore changes.

FIG. 30

Fundamental and Technical Filters									
<p>Filter Name:</p> <p>Momentum1</p> <p>Hi_EPS_growth technical filter 3</p> <p>Momentum1</p> <p>Portfolio_4</p> <p>New Delete</p>	<p>Conditions:</p> <table border="1"><tr><td>Select Variable ...</td><td>Arithmetic Operator ...</td><td>Comparison Operator ...</td><td>Constant ...</td></tr></table> <p>MAVG10 >= MAVG50</p> <p>MAVG10 >= MAVG50</p> <p>Price >= Low_52week * 1.20 Vol_Avg_Daily_Dollar > 2.0</p> <p>Add Edit Remove</p>	Select Variable ...	Arithmetic Operator ...	Comparison Operator ...	Constant ...	<p>View Symbols</p> <p>IVAX</p> <table border="1"><tr><td>ABX ABS BMY DF DNY EC IVAX LLY</td><td>MRK MCD MLI NOC PCG</td><td></td></tr></table> <p>Add Symbol Remove Symbol</p>	ABX ABS BMY DF DNY EC IVAX LLY	MRK MCD MLI NOC PCG	
Select Variable ...	Arithmetic Operator ...	Comparison Operator ...	Constant ...						
ABX ABS BMY DF DNY EC IVAX LLY	MRK MCD MLI NOC PCG								
<p>OK Cancel Help</p>									

FIG. 31

Defining Baskets: Fundamental and Technical Filters

Whereas the Symbol Lists window is used to set up lists of known symbols, the Fundamental and Technical Filters window is used to set up lists of symbols with desired market-, portfolio-, and risk characteristics. Each such list is called a "Filter". The window is partitioned into two sections: (1) Filter Name and (2) Conditions.

To create and name a new filter, enter the new name in the top field under Filter Name and click **New**. The name will be entered in the lower field along with the names of existing filters. To delete an existing filter, including both its name and conditions, highlight the name in the lower field and click **Delete**. Highlight the name in the lower field to define the conditions of the filter, as described below.

Conditions of a filter are used to describe its characteristics. The system searches to find all securities which satisfy all of the stated conditions. (To create a filter where any, not all, of the conditions are met, first create filters of one condition, and then apply the union operator to those filters in the Define baskets window.) A Condition may consist of variables, arithmetic operators, numerical constants, and a comparison operator, such as "greater than or equal to". Variables can be pre-defined by the system and include large numbers of fundamental, technical, historical, and descriptive characteristics. These variables and their mnemonic abbreviations are accessed through a pop-up screen in response to clicking the **Select Variable** button. Examples of variables are "one-year-ago earnings per share", "10-day moving average", "percent change in price over last 30 days", and "shares outstanding". Users can create new variables by combining system variables with arithmetic operators, as in [Book Value / Shares Outstanding]. Thus, user-defined expressions can be created and tested against user-defined benchmarks, as in the condition, [Book Value / Shares Outstanding <= Current Price].

To create a new condition, type the condition in the top field under "Conditions" and click **Add**. To modify a condition, highlight the condition in the lower field and click **Edit**. To delete a condition, highlight it in the lower field and click **Remove**.

Once at least one condition has been entered for a filter, clicking **View Symbols** will display the symbols that are associated with the filter. To add symbols individually, type a symbol in the top field under the **View Symbols** button and click **Add Symbol**. To delete a symbol from the list, highlight the symbol and click **Remove Symbol**.

To save the changes that have been made, click **OK**. To ignore the changes that have been made since the last Save, click **Cancel**.

FIG. 32

FIG. 33

FIG. 33

BarterSecurities Control Center

The **Control Center** is the starting point to create and send orders, and to check on trades and positions. Although users may have multiple accounts, the information shown in the **Control Center** applies only to the **Account** designated in the upper left corner.

You may create a new order by clicking the **Place Order** button on the upper right of the screen. Doing so pops up the Order Entry screen from which you may (1) save the order for later use, (2) create a Market or Limit order, or (3) trade directly from the Limit Order Book (LOB) for your order.

The **Open Orders** tab shows orders that have been sent and are pending prior to execution. For example, if you submit a limit order that is away from the market and so cannot be traded, it will be shown in this tab. Orders are shown as Open, Filled, Out, Canceled, Part Fill, Part Fill--Canceled, or Part Fill--Out. Right-clicking on an order's line brings up a menu which allows you to change or cancel the order. Note that when you trade directly from the LOB, you receive an instantaneous confirmation; hence, your order will not show up in the Open Orders tab.

The **Order History** tab summarizes the barter trades that you have made. By default, trades for all symbols are shown. By filling in the appropriate fields, you may choose to limit the viewed barter trades to only those involving one stated symbol, or only those involving two stated symbols in combination. You may also choose to view only those trades within a stated historical time period. By clicking on a column header, you may sort trades in the list according to the column's attribute. (E.g., "symbol" or "Date/Time".)

The **Saved Orders** tab shows all orders that you have saved for delivery in the future. If you saved an order from the Market Order Entry or Limit Order Entry screens, that fact is indicated in the **Type** column. Double-clicking on one of these orders pops up the respective Market or Limit screen for modification of the order and/or order delivery. If you saved the original order from the main **Order Entry** screen, then there is no corresponding indicator in the **Saved Orders** tab. Double-clicking on such an order pops up the main **Order Entry** screen from which you can initiate a limit or market order or choose to trade directly from the LOB. Right-clicking on any saved order pops up a menu that allows you to trade the order from the LOB, edit the order, or delete it.

The **Portfolio** tab lets you view your current inventory of long and short securities. Double-clicking on any security's row in this tab pops up the main **Order Entry** screen with the security symbol and quantity filled in to effect a closing trade. For example, if you are short 500 IBM, the **Order Entry** screen would show a buy of 500 IBM. After filling in a buy-side security and quantity, you may submit the order.

FIG. 34

Open Orders	Order History	Saved Orders	Portfolio	Messages																																													
<div style="display: flex; justify-content: space-between;"><div style="width: 45%;"><p><input type="radio"/> All</p><p><input type="radio"/> Symbol <input style="width: 50px;" type="text"/> All Trades ▼</p><p>Symbol <input style="width: 50px;" type="text"/> (optional)</p></div><div style="width: 45%;"><p><input type="radio"/> All Dates Go</p><p><input type="radio"/> Previous <input style="width: 40px;" type="text"/> days.</p><p><input type="radio"/> From <input style="width: 30px;" type="text"/> / <input style="width: 30px;" type="text"/> / <input style="width: 30px;" type="text"/> to <input style="width: 30px;" type="text"/> / <input style="width: 30px;" type="text"/> / <input style="width: 30px;" type="text"/></p><div style="display: flex; justify-content: space-around; font-size: small;"><div><input type="text"/> MM <input type="text"/> DD <input type="text"/> YY</div><div><input type="text"/> MM <input type="text"/> DD <input type="text"/> YY</div></div></div></div> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"><thead><tr><th>Date</th><th>Sym.</th><th>Name</th><th>B/S</th><th>Shares</th><th>Price</th><th>Amount</th><th>Comm.</th><th>Order ID</th></tr></thead><tbody><tr><td>12/20/01</td><td>MSFT</td><td>MICROSOFT...</td><td>BUY</td><td>2000</td><td>63.02</td><td>\$126,040</td><td>\$6.00</td><td>123678</td></tr><tr><td>12/20/01</td><td>CSCO</td><td>CYSCO SYS...</td><td>SELL</td><td>7000</td><td>18.50</td><td>\$129,500</td><td>\$6.00</td><td>123679</td></tr><tr><td>12/19/01</td><td>GPS</td><td>GAP INC</td><td>BUY</td><td>6000</td><td>12.95</td><td>\$ 77,700</td><td>\$6.00</td><td>124821</td></tr><tr><td>12/19/01</td><td>QQQ</td><td>NASDAQ 100...</td><td>SELL</td><td>2000</td><td>36.40</td><td>\$ 72,800</td><td>\$6.00</td><td>123622</td></tr></tbody></table>					Date	Sym.	Name	B/S	Shares	Price	Amount	Comm.	Order ID	12/20/01	MSFT	MICROSOFT...	BUY	2000	63.02	\$126,040	\$6.00	123678	12/20/01	CSCO	CYSCO SYS...	SELL	7000	18.50	\$129,500	\$6.00	123679	12/19/01	GPS	GAP INC	BUY	6000	12.95	\$ 77,700	\$6.00	124821	12/19/01	QQQ	NASDAQ 100...	SELL	2000	36.40	\$ 72,800	\$6.00	123622
Date	Sym.	Name	B/S	Shares	Price	Amount	Comm.	Order ID																																									
12/20/01	MSFT	MICROSOFT...	BUY	2000	63.02	\$126,040	\$6.00	123678																																									
12/20/01	CSCO	CYSCO SYS...	SELL	7000	18.50	\$129,500	\$6.00	123679																																									
12/19/01	GPS	GAP INC	BUY	6000	12.95	\$ 77,700	\$6.00	124821																																									
12/19/01	QQQ	NASDAQ 100...	SELL	2000	36.40	\$ 72,800	\$6.00	123622																																									

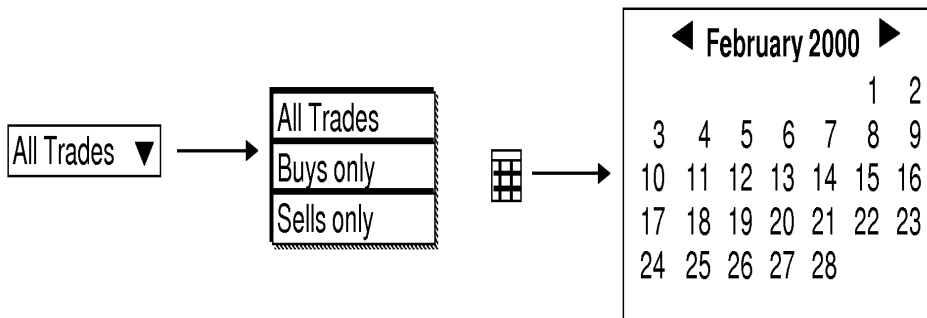


FIG. 35

Replacement Sheet
US Appl. No. 10/086,116
Attorney Docket No.: 69174-5

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Open Orders		Order History		Saved Orders		Portfolio		Messages	
Type	Buy Symbol	Action/ Quantity	Sell Symbol	Action/ Quantity	Debit / Credit	Special Cond.?	Date / Time		
LOB	MSFT	BUY 1000	INTC	SELL 2000			12/19/01 13:18		
MKT	CSCO	BUY 6000	SEBL	SELL 4000		Yes	12/19/01 13:19		
LIM	MSFT	BUY 1000	CSCO	SELL 3000	PAY \$3,100	No	12/19/01 13.21		
LOB	VRTS	BUY 2000	CSCO	SELL 4000			12/19/01 13:18		

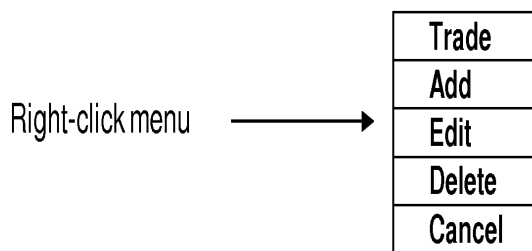


FIG. 36

BarterSecurities Order Entry					
Account	645789 ▾		<input type="button" value="Help"/>		
	Buy Side		Sell Side		
Symbol	MSFT	<input type="button" value="Lookup"/>	INTC	<input type="button" value="Lookup"/>	
Shares	1000	<input type="button" value="\$"/>	2000	<input type="button" value="\$"/>	
<input type="button" value="Trade From Order Book"/>		<input type="button" value="Market Order"/>		<input type="button" value="Limit Order"/>	
		<input type="button" value="Save"/>	<input type="button" value="Clear"/>	<input type="button" value="Close"/>	

Calculate Shares	
<input type="button" value="\$"/> →	Enter Dollar Amount <input type="text"/>
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

FIG. 37

BarterSecurities Order Entry

Bring up the **Order Entry** screen either by clicking the **Place Order** button on the **BarterSecurities Control Center**, or by double-clicking a saved order. To begin to place an order, first make sure the **Account** number in the upper left of the screen is correct. Then describe your order by filling in just four fields: buy-side symbol, sell-side symbol, buy-side shares and sell-side shares.

If you wish to express quantity in terms of dollars, click the "\$" button next to a **Shares** field. The **Calculate Shares** screen pops up in which you can enter the desired number of dollars. Clicking **OK** transforms the dollars into shares of a security based on the **Last Trade** price of the security.

Unlike traditional one-sided orders, you don't have to specify limit or market status to trade a barter order unless you prefer to do so. You can trade directly from the [Limit Order Book](#) for your order.

Market Orders

To send a market order after you have filled in symbol and quantity information, click **Market Order**. You will be asked whether you would like to attach contingencies to your order. For example, you could send your market order only when the price of your buy-side security touches \$50. To learn more click [Market Order entry](#).

Limit Orders

To send a limit order after you have filled in symbol and quantity information, click **Limit Order**. You will be asked to attach a limit price to your order as well as other optional information. To learn more click [Limit Order entry](#).

Trade from Order Book

To view the current offers for your order, or to trade directly against the existing offers for your order, click **Trade from Order Book** after you have filled in symbol and quantity information on the **Order Entry** screen. Using the Limit Order Book (LOB) lets you complete a trade without specifying a limit price for your trade and even without specifying Market or Limit status. You can trade on individual offers that are internal to the BarterSecurities system, or you can trade simultaneously with one-click (Quick Fill) on all of the available internal offers up to the quantities that you specified in your incoming order. To learn more about the fastest way to trade your order, click [Limit Order Book](#).

Save Order

To save an order for use later click the **Save** button. The order is saved in the **Saved Orders** tab of the **Control Center**. When you double-click the order in the **Control Center**, your order will pop up in the **Order Entry** screen, from which you can designate a market or limit order, or **Trade from Order Book**. If you wish to save an order along with limit order information, you should click the **Limit Order** button on the **Order Entry** screen, enter the relevant information, and then click the **Save** button on the **Limit Order Entry** screen. The order will still be saved in the **Saved Orders** tab of the **Control Center**, but double-clicking the order will pop up the **Limit Order Entry** screen from which you can modify your information and/or send your order. Likewise for saved market orders.

FIG. 38

View Level II Quotes

View National Markets

BarterSecurities Limit Order Book

Buy 1000 MSFT / Sell 2000 INTC

View

Help

National Best Bid and Offer (NBBO)

Sym	LT	Chg	Bid	Ask	Size
MSFT	54.98	+1.30	54.98	55.00	500 x 500
INTC	27.01	+0.80	27.00	27.02	200 x 1000

Fill Order

BUY 1000 MSFT @ 55.0075

SELL 2000 INTC @ 27.00

You save
\$38.50.

Quick Fill

Internal Offers

View Level II Quotes

View National Markets

Type	Shares MSFT x INTC	MSFT Ask	Cost compared to Nat'l prices	
Lim	500 x 1000	54.995	SAVE \$13.50	Trade
MM	250 x 500	55.01	SAVE \$13.75	Trade up to
MM	250 x 500	55.03	SAVE \$11.25	Trade up to

Limit Order

Market Order

Close

FIG. 39

BarterSecurities Limit Order Book (LOB)

You can use the LOB to view national-market information for the securities that comprise your barter order, or you may view and trade on the BarterSecurities system-generated ("Internal") offers for your order. When you trade on an Internal offer, you receive an **Instant Confirmation**.

For the stocks that you specified in the Order Entry screen you can view traditional single-stock National Best Bid and Offer (NBBO) prices and sizes, single-stock national Level II quotes, and national-market offers for your barter order.

You can trade on individual Internal offers, or you can trade simultaneously with one-click ("**Quick Fill**") on all of the available Internal offers up to the quantities that you specified in your incoming order. You can observe the value of the difference between National and Internal offers for your barter order ("**You Save**").

What do you want to link to?

National Market Information

Creating National Market Responses on the Limit Order Book

Trading on Individual Offers for a Barter Order

Trading using the Quick Fill button

Calculation of Savings from Internal Offers on the Limit Order Book

Instant Confirmation

FIG. 42

National Market Information

The BarterSecurities Limit Order Book (LOB) provides three types of national market information for the stocks that you specified in the Order Entry screen: (1) National Best Bid and Offer (NBBO) markets, (2) Level II Quotes, and (3) national offers for you barter (two-sided) order.

NBBO Markets

The top section of the LOB shows your incoming order and the NBBO markets for the two stocks that you specified in your order. The NBBO information shown is the last trade, daily price change, bid, ask, bid size, and ask size for each security. Bid and ask sizes are shown in numbers of shares, rather than in hundreds of shares. Columns can be reordered by dragging and dropping.

Level II Quotes

Level II Quotes for the two stocks that you specified in your barter order can be viewed either by clicking the **View Level II Quotes** button in the Individual Offers section of the LOB, or by choosing **View Level II Quotes** from the **View** menu at the top of the LOB.

In the Level II Quotes screen live Level II bids and offers are shown for your sell-side security on the left and for your buy-side security on the right. Clicking the <Collapse> button places the bids of the security that you intend to sell next to the asks of the security that you intend to buy. In this form it is easier to see the capacity of the national markets to satisfy your incoming order.

National ("External") Barter Offers

National offers for your two-sided order can be viewed either by clicking the **View National Markets** button in the Individual Offers section of the LOB, or by choosing **View National Markets** from the **View** menu at the top of the LOB.

The National Markets screen shows the quantity of shares (in the ratio that you specified in your incoming order) that is available at respective bid prices (for your sell-side stock) and ask prices (for your buy-side stock). This information is compared to the offers that are internal to the BarterSecurities system to calculate the price and quantity advantages of trading on Internal markets.

FIG. 43

Trading on Individual Offers for a Barter Order

The bottom section of the Limit Order Book (LOB), entitled "Internal Offers", normally shows several offers for the two-sided order that you specified in the Order Entry screen. These offers are internal to the BarterSecurities system; i.e., they are not available in the national markets. The system displays all available internal offers up to a cumulative share quantity equal to the quantities that you specified in Order Entry screen. The offers are ranked from most favorable to least favorable offer price, and they retain the ratio of buy-quantity to sell-quantity that you specified. **IMPORTANT:** All offers are expressed as selling your sell-side security on the current NBBO bid price and buying your buy-side security at the variable Ask price shown.

The data displayed for each internal offer are (1) a barter quantity expressed in actual (not hundreds of) shares, (2) a sell-side security bid price (i.e., the current NBBO bid), (3) a buy-side security ask price (used to rank the offers) and (4) a dollar amount of savings relative to executing your order on the national markets. See how Savings is computed.

Next to the most attractive offer is a **Trade** button and next to each subsequent offer is a "**Trade up to**" button. Clicking on one of these buttons generates an instantaneous trade report at the quantities and prices currently displayed. If a trader clicks a "**Trade up to**" button, then the indicated offer and all more attractive offers are sent for execution. **NOTE:** Traders must exercise care if displayed offers are changing rapidly.

A **Save** amount less than zero means that it may be more expensive to execute your order internally (i.e., on the BarterSecurities system) than on a national market. However, the BarterSeucirites system has these advantages: (1) your order confirmation is immediate, (2) your specified security quantity ratio is preserved, and (3) the internal quantity depth offered may be greater than on the national market.

FIG. 44

Trading using the Quick Fill button

The middle section of the Limit Order Book (LOB), entitled "Fill Order", provides a convenient way to view the aggregation of the Individual Offers shown in the bottom section of the LOB. The Quick Fill offer is designed to fill your incoming order, provided that enough individual offers exist to do so. The Quick Fill quantity is the sum of the available individual offer quantities up to the size of your incoming order. The Quick Fill sell-side price is that security's current NBBO bid and the buy-side price is the quantity-weighted average of the individual offer buy-side ask prices.

The data displayed for the Quick Fill offer are (1) buy- and sell-side quantities expressed in actual (not hundreds of) shares, (2) the sell-side security bid price (i.e., its current NBBO bid), (3) a buy-side security ask price and (4) a dollar amount of savings relative to trading the Quick Fill quantities on the national markets. See how Savings is computed.

To trade against the Quick Fill offer, just click the **Quick Fill** button. Doing so generates an instantaneous trade report at the quantities and prices currently displayed. NOTE: Traders must exercise care if displayed offers are changing rapidly.

Quick Fill savings less than zero means that it may be more expensive to execute your order internally (i.e., on the BarterSecurities system) than on a national market. However, the BarterSecurities system has these advantages: (1) your order confirmation is immediate, (2) your specified security quantity ratio is preserved, and (3) the internal quantity depth offered may be greater than on the national market.

FIG. 45

Instant Confirmation		
You Bought	1000 MSFT	@ 63.13
You Sold	2000 INTC	@ 31.67
<input type="checkbox"/> Do not show Instant Confirmations		
<input type="button" value="OK"/>		

FIG. 46

Instant Confirmation
<p>Whenever the Quick Fill button (middle of LOB) or a Trade or "Trade up to" button (lower part of LOB) is clicked, an immediate confirmation is generated. The Instant Confirmation shows the amount of the buy-side security purchased and the amount of the sell-side security sold, along with the respective prices.</p> <p>If an LOB offer is changing as it is clicked, the Instant Confirmation may not be for the amount of buy-side and sell-side securities that you intended to buy/sell. However, the following conditions are always satisfied: (1) you will always trade the buy-side and sell-side securities in the ratio indicated in the Order Entry screen, and (2) you will never trade more than the quantities indicated in the Order Entry screen.</p> <p>When the Instant Confirmation is received, you no longer have an order pending. If you have not traded all of the quantity that you desired to trade, you must send an additional order by clicking again on the Quick Fill or Trade (or "Trade up to") buttons. The maximum quantities shown in the offers will reflect the amount of the original order that has already been traded.</p>

FIG. 47

Creating National Market Responses on the BarterSecurities Limit Order Book

To illustrate how national offers for a barter order are calculated, suppose you have just submitted the order:

BUY 1000 MSFT / SELL 2000 INTC.

Also assume that the national order books for INTC on the bid side and MSFT on the ask side are as shown in Tables 1A and 1B.

Table 1A INTC: National Bids	
Bid Price	Bid Size
27.00	200
26.99	500
26.98	500
26.97	1000

Table 1B MSFT: National Asks	
Ask Price	Ask Size
55.00	500
55.01	1000

Offer prices for your order (executed in a 2-1 ratio) as derived from the national markets for the single stocks, are shown in Table 2 in order of best to worst offer.

Table 2 National Offers for your Barter Order Buy 1000 MSFT / Sell 2000 INTC				
Row Number	Size (MSFT x INTC)	INTC Bid Price	MSFT Ask Price	Barter Offer Price (MSFT – 2 x INTC)
1	100 x 200	27.00	55.00	1.00
2	250 x 500	26.99	55.00	1.02
3	150 x 300	26.98	55.00	1.04
4	100 x 200	26.98	55.01	1.05
5	400 x 800	26.97	55.01	1.07

Based on the best MSFT offer of 500 shares (Table 1B), the system looks for 1000 shares on the INTC side. It finds only 200 INTC at the best price (Table 1A), so that only 100 MSFT can be matched with it (Table 2, row 1), leaving 400 MSFT offered at 55.00. The 400 MSFT at 55.00, requires 800 INTC, but there is only 500 INTC at the next price of 26.99 (Table 1A). It can be matched against only 250 MSFT at 55.00 (Table 2, row 2), leaving 150 MSFT at 55.00 that is still usable, and so on until there is enough depth to fill your order, or until the national books are exhausted.

In Table 2, the Barter Offer Price is the cost of trading the indicated piece of your order at each row's prices and sizes, and is expressed per 100 shares of the buy side, in this case MSFT.

FIG. 48

**Calculation of Savings from Internal Offers
on the BarterSecurities Limit Order Book**

Trading on the BarterSecurities system saves you money relative to the national markets. An illustration of this is given below.

Suppose you have just submitted the order: BUY 1000 MSFT / SELL 2000 INTC.

Also suppose that the national market offers for your order are as is shown in Table 1. To see how these offers were calculated, [click here](#). [Table 1--See Figure 50]

Often, there are additional offers that are internal to the BarterSecurities system that will improve national markets by providing either more favorable execution prices, by providing a greater quantity to trade, or both. Certain offers may originate with professional marketmakers. Other internal offers may arise due to outstanding limit orders, either alone or in combination. For example, a limit order to buy INTC and sell CSCO, and a second order to buy CSCO and sell MSFT, may create an "implied" offer for an incoming barter order to buy MSFT and sell INTC. To learn more, see Order Matching.

Suppose that one marketmaker is willing to respond to your barter order by simultaneously buying 1000 INTC at 27.00 and selling 500 MSFT at 55.00, and that a second marketmaker is willing simultaneously to buy 1000 INTC at 26.99 and sell 500 MSFT at 55.01. In the form of the previous table, the marketmaker offers are expressed in Table 2. [Table 2--See Figure 50]

The offer prices for your barter order, updated to include the marketmaker offers, are shown in Table 3. Note that the second marketmaker's internal response is split into two rows (#4 and #5) because only the first row of the two is necessary to fill your order of 2000 INTC, 1000 MSFT. [Table 3--See Figure 50]

The introduction of internal offers represents savings to you, the customer. To compute these savings, which are shown in Table 4, the system compares the internal offers to the offers that would have been available for those same shares in the national markets. In Table 4 [Table 4--See Figure 50] the first row shows that the first internal offer of 500 shares (Table 3, row 2) takes the place of three national offers of varying share amounts (Table 3, rows 1, 3, and 6). That is, an offer of 1.00 replaces three national offers of 1.00, 1.02, and 1.04. The weighted national offer is 1.022 (i.e., $\$1.00 \times 100 + \$1.02 \times 250 + \$1.04 \times 150$), so the savings is \$11.00 ($500 \times \$0.022$). Similarly, the Internal offer of 1.03 (Table 3, rows 4 and 5) would have been traded at 1.05 and 1.07 in the national market (Table 3, rows 7 and 8), implying a savings of \$18.00 ($\$0.02 \times 100 + \0.04×400) on the BarterSecurities internal side. The total savings for your complete order is \$29.00.

FIG. 49

**Calculation of Savings from Internal Offers
on the BarterSecurities Limit Order Book**

Tables 1-4

Table 1 National Offers for your Barter Order Buy 1000 MSFT / Sell 2000 INTC				
Row Number	Size (MSFT x INTC)	INTC Bid Price	MSFT Ask Price	Barter Offer Price (MSFT – 2 x INTC)
1	100 x 200	27.00	55.00	1.00
2	250 x 500	26.99	55.00	1.02
3	150 x 300	26.98	55.00	1.04
4	100 x 200	26.98	55.01	1.05
5	400 x 800	26.97	55.01	1.07

Table 2 Marketmaker Offers			
Size (MSFT x INTC)	INTC Bid Price	MSFT Ask Price	Barter Offer Price (MSFT – 2 x INTC)
500 x 1000	27.00	55.00	1.00
500 x 1000	26.99	55.01	1.03

Table 3 BarterSecurities Offers for your Barter Order Buy 1000 MSFT / Sell 2000 INTC					
Row Number	Size (MSFT x INTC)	INTC Bid Price	MSFT Ask Price	Order Type	Barter Offer Price (MSFT – 2 x INTC)
1	100 x 200	27.00	55.00	National	1.00
2	500 x 1000	27.00	55.00	Internal	1.00
3	250 x 500	26.99	55.00	National	1.02
4	150 x 300	26.99	55.01	Internal	1.03
5	350 x 700	26.99	55.01	Internal	1.03
6	150 x 300	26.98	55.00	National	1.04
7	100 x 200	26.98	55.01	National	1.05
8	400 x 800	26.97	55.01	National	1.07

Table 4 Savings from Internal Order					
Buy-side Shares	Internal Offers		National Offers		Savings
	Table 3 Rows	Barter Offer Price	Table 3 Rows	Barter Offer Price	
(1)	(2)	(3)	(4)	(5)	(1) x [(5) – (3)]
500	2	1.00	1,3,6	1.022	\$11.00
500	4,5	1.03	7,8	1.066	\$18.00
Total					\$29.00

FIG. 50

BarterSecurities Limit Order Entry

Buy 1000 MSFT Sell 2000 INTC	Last	Bid	Ask
	PAY \$960	PAY \$930	PAY \$1,000

Total Dollar Limit (before
☒ Pay no more than ☐ Receive at least \$ 850

Dollar Limit Calculator

MSFT Price

INTC Price

	Last	Chg	Bid	Ask	Size
MSFT	54.98	+1.30	54.97	55.00	500 x 500
INTC	27.01	+0.80	27.00	27.02	200 x 1000

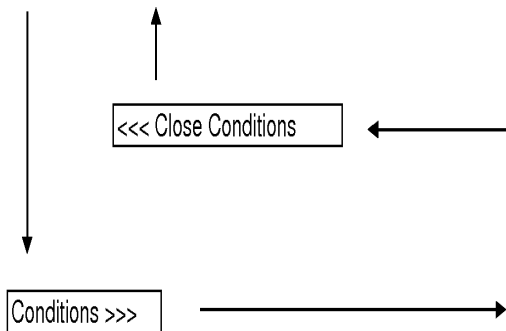


FIG. 51

BarterSecurities Limit Order Entry

Buy 1000 MSFT Sell 2000 INTC	Last	Bid	Ask
	PAY \$960	PAY \$930	PAY \$1,000

Total Dollar Limit (before
☒ Pay no more than ☐ Receive at least \$ 850

▼

☐ All or None

☐ Do not reduce

☐ Minimum sell-side shares:

Trade order only if--

☐ MSFT price is less than or equal to ▼

☐ INTC price is less than or equal to ▼

Dollar Limit Calculator

MSFT Price

INTC Price

	Last	Chg	Bid	Ask	Size
MSFT	54.98	+1.30	54.97	55.00	500 x 500
INTC	27.01	+0.80	27.00	27.02	200 x 1000

BarterSecurities Market Order Entry	
Buy 1000 MSFT / Sell 2000 INTC	
<input checked="" type="radio"/> No price contingencies	
<input type="radio"/> Execute Dual Market Order when buy side price touches	\$ <input type="text"/>
<input type="radio"/> Execute Dual Market Order when buy side price touches	\$ <input type="text"/>
<div><input type="button" value="Submit"/> <input type="button" value="Save"/> <input type="button" value="Close"/></div>	

FIG. 52

Limit and Market Orders

Limit Orders

Usually, limit prices for a barter order are expressed in terms of a Total Dollar Limit for the order as a whole, rather than in terms of per-share limit prices for individual securities.

Consider the barter order to Buy 1000 MSFT and Sell 2000 INTC. Suppose a trader wants to net from this order the same amount as if MSFT traded at \$50 and INTC traded at \$26. This is equivalent to receiving \$2000; i.e., $[2,000 \times \$26 - 1,000 \times \$50]$. By setting the Total Dollar Limit to "Receive at least \$2000", the trader allows the trade to execute at any combination of per-share prices that satisfy the limit, such as $(\$50/\$26)$, $(\$52/\$27)$, $(\$49/\$25.50)$, etc.

The Total Dollar "current market" is shown in the upper right corner of the Limit Order Entry screen under the headers Last, Bid, and Ask. These values are based on the markets in the individual securities shown at the bottom of the screen. If you enter an order to BUY 1000 MSFT / SELL 2000 INTC, and if the current single-stock markets are:

	Last	Bid	Ask
MSFT	54.98	54.97	55.00
INTC	27.01	27.00	27.02

Then, as explained below, the Total Dollar spread of a barter order Buy 1000 MSFT / SELL 200 INTC would be:

	Last	Bid	Ask
PAY \$960	PAY \$930	PAY \$1000	

The Total Dollar "Last" is based on the "Last" prices of the individual securities. That is, "PAY \$960" = $+1000 \times 54.98 - 2000 \times 27.01$. The Total Dollar Bid is based on buying MSFT on its bid and selling INTC on its ask; i.e., "PAY \$930" = $+1000 \times 54.97 - 2000 \times 27.02$. Normally you would not be able to trade at these prices immediately, but marketmakers might be able to do so. The Total Dollar Ask is based on buying MSFT on its ask and selling INTC on its bid; i.e. "PAY \$1, 000" = $+1000 \times 55.00 - 2000 \times 27.00$. Normally you would be able to trade at these prices immediately.

Thus, a Total Dollar Limit of "Pay no more than \$850" is \$150 more favorable to you than the value at which you can trade immediately, and it is \$80 more favorable than the value at which marketmakers might be able to trade your order for themselves.

If you prefer to think about your Total Dollar Limit in terms of individual stock prices, you may use the **Dollar Limit Calculator** in the middle of the Limit Order Entry Screen. Enter two share prices and click the **Insert Dollar Limit** button to create your Total Dollar Limit.

Setting a Total Dollar Limit can produce the same dollar results for a barter order as setting per-share limits, but it is less restrictive. It is recommended because it produces a greater probability of getting a barter order executed. Per-share limits should be used only if you are sensitive to the trade price of one of the legs of the order. If you do wish to set a per-share limit price for one or both securities in your barter order click on **Conditions>>>**. An additional segment of the Limit Order Entry screen appears, which allows you to set per-share limit prices and to set timing and other options for your order.

Market Orders

The default market order is "No price contingencies", which means that your order will be delivered as soon as you submit and confirm it. Alternatively, you may place a per-share price contingency on the delivery of the order. Upon submitting the order the system will ask you to confirm your order currently, but the order will not be delivered to the market until the indicated price contingency is satisfied. If and when the order is delivered to the market, it will behave like two traditional market orders: one for the buy leg and one for the sell leg.

FIG. 53

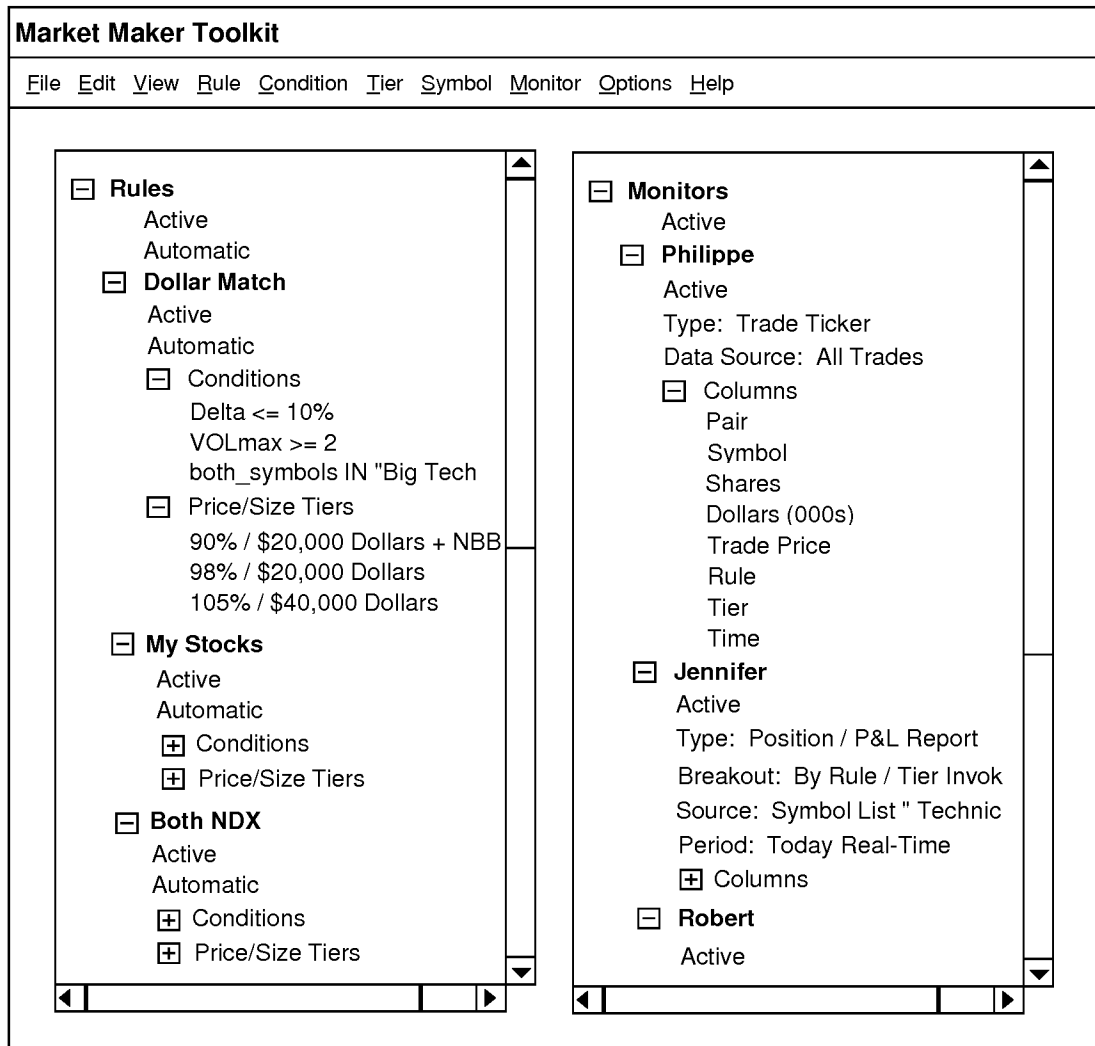


FIG. 54

Marketmaker Toolkit

The BarterSecurities system provides a **toolkit** which allows marketmakers to

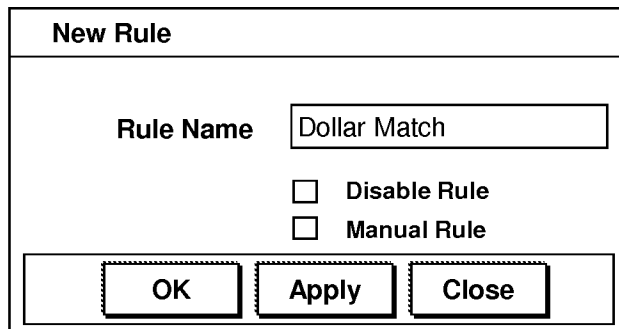
- **measure the attractiveness** of any incoming barter order,
- specify how aggressively or passively to **respond** to it, either manually or automatically, using customized rules, and
- **isolate the profit and loss impact** of each decision rule on a real-time basis.

Each **rule** that a marketmaker composes consists of a set of **conditions** and a set of **price and size tiers** which define the responses to a barter order if the conditions are satisfied.

For example, conditions might filter for particularly attractive barter orders with the buy- and sell- legs in roughly equal dollar amounts, having high liquidity, and coming from the same industry. A marketmaker can choose to show an automatic response to these types of orders at the corresponding NBBO price reduced by, say, 20% of the NBBO spread, for the current NBBO size. (Note that at the time that a response to an order is made, marketmakers know which security is being bought and which security is being sold.)

Marketmakers can customize **trade tickers**, or **position and P&L reports** to give them exactly the information they need on a real-time basis. Each report is associated with a **data source**, so that a P&L report may be constructed for only the securities in a defined symbol list, or only the trades that were invoked by a selected rule, etc.

FIG. 55



The image shows a 'New Rule' dialog box. It has a title bar 'New Rule'. Inside, there is a label 'Rule Name' followed by a text input field containing 'Dollar Match'. Below this, there are two checkboxes: 'Disable Rule' and 'Manual Rule', both of which are currently unchecked. At the bottom of the dialog box, there are three buttons: 'OK', 'Apply', and 'Close'.

FIG. 56

Creating a Marketmaker Toolkit Rule

To create a rule, select **New...** from the **Rule** menu of the Marketmaker Toolkit. In the **New Rule** pop-up screen, enter the name of your rule, and choose whether to disable the rule or to make the rule manual.

Only Active rules are used to respond to barter orders. A rule can be activated or disabled at any time by right-clicking the rule name in the Toolkit and selecting the appropriate attribute. Disabled rules are dimmed in the Toolkit window.

All active rules produce automatic responses to barter orders if the rule's conditions are satisfied, unless you choose to respond manually. Responses to orders can be toggled from automatic to manual by right-clicking the rule name and selecting the appropriate attribute.

FIG. 57

Add Condition		
Variable	Operator	Value
Delta ▼	== ▼	
<div>OK Apply Close</div>		

Delta ▼	→	<div>Delta SICmatch MCAPmax MCAPmin VOLmax VOLmin BA_Debit buy_symbol</div>
---------	---	---

FIG. 58

Creating a Marketmaker Toolkit Condition

To create a set of conditions for a rule first click on the rule to select it. Then select **New...** from the **Condition** menu. In the **Add Condition** pop-up screen, choose a **Variable** and an **Operator** and enter a **Value** to define the condition.

Variables are keywords that define characteristics of the barter order such as (1) closeness of the buy-side and sell-side dollar amounts, (2) industry closeness of the two legs, (3) volumes, (4) market capitalizations, etc. Additionally, marketmakers can use variables to test for inclusion in default symbol lists, such as the S&P500, or in symbol lists that they define using the **Symbol** menu in the Toolkit.

Operators are usually equality and inequality signs, but change to <IN> and <NOT IN> when a variable is testing for inclusion in a symbol list.

An example of a condition is:

Delta < 10%,

where Delta is a measure of the closeness of the buy-side and sell-side dollar amounts. A delta of 10% means that the dollar amounts of the two barter order legs differ by 10% of the greater amount.

Another example of a condition is:

buy_symbol IN "Big Tech",

where "Big Tech" is the name of a symbol list that the user has defined.

FIG. 59

Definitions of Variables and Allowable Value Ranges or Units.

See Examples

Legend:

Variable (range or units)
Definition

Delta (0-100%)

$\text{abs}(\$long - \$short) / (\max(\$long, \$short))$

SICmatch (0,1,2,3,4)

Number of SIC code digits of buy and sell that match, starting from left.

MCAPmax (\$bil)

Market Cap of larger-cap stock

MCAPmin (\$bil)

Market Cap of smaller-cap stock

VOLmax (\$mil)

Avg Daily \$-volume traded, last 30 days, of more-active stock.

VOLmin (\$mil)

Avg Daily \$-volume traded, last 30 days, of less-active stock.

BA_Debit (Dollars)

Debit value of bid/ask spread of Barter Order on NYSE and Nasdaq inside prices.

The following variables are used to check for inclusion in a Symbol List.

buy_symbol (List Name)

Symbol of the incoming order's buy-side security.

sell_symbol (List Name)

Symbol of the incoming order's sell-side security.

both_symbols (List Name)

The set of two incoming security symbols.

one_symbol (List Name)

At least one of the incoming security symbols.

The following variables are used to query a marketmaker's (MM) portfolio status.

Inventory_Buy_Shs (Shares)

The number of shares of the incoming sell-side security (i.e., the MM is buying) currently in the MM portfolio.

Inventory_Sell_Shs (Shares)

The number of shares of the incoming buy-side security (i.e., the MM is selling) currently in the MM portfolio.

Inventory_Buy_Val (Dollars)

The dollar value of the incoming sell-side security (i.e., the MM is buying) currently in the MM portfolio.

Inventory_Sell_Val (Dollars)

The dollar value of the incoming buy-side security (i.e., the MM is selling) currently in the MM portfolio.

FIG. 60

Examples of Variable usage.

Delta measures the dollar amount of exposure of the Barter Order. If the retail trader's buy side debit is \$100,000 and the sell side credit is \$75,000, the **delta** is

$$25\% = |100000 - 75000| / \max(100000, 75000).$$

SICmatch shows how industry-related two stocks are. Matched digits are counted from the left until a match fails, after which remaining digits do not count.

SIC #1	SIC #2	SICmatch
4013	4031	2
2631	4031	0.

MCAPmax and **MCAPmin** measure market capitalization of the bigger and smaller stock, respectively. To ensure that both stocks' market cap exceeds \$1 billion, enter "MCAPmin >= 1". To ensure that at least one stock's market cap exceeds \$10 billion, enter "MCAPmax >= 10".

VOLmax and **VOLmin** measure the dollar volume of the more- and less-active stock, respectively. To ensure that both stocks trade at least \$2 million per day, on average, enter "VOLmin >= 2". To identify trades in which neither stock trades more than \$2 million per day, on average, enter "VOLmax <=2".

BA_Debit is the dollar width of a Barter Order on the NBBO market. If a retail trader wishes to buy 100 ABC on the NBBO market 50-50.25 and sell 300 XYZ on the NBBO market 20-20.10, then the dollar size of the spread is \$55, or $100 \times 0.25 + 300 \times 0.10$.

"Symbol" variables allow the marketmaker to identify whether stock symbols fall in marketmaker-created lists. Suppose the marketmaker sets the symbol list below:

List_1: IBM, CPQ, DELL, SUNW, HWP

To ensure that at least one of the Barter Order symbols falls in the list, enter
one_symbol IN List_1.

To ensure that neither Barter Order symbol falls in the list, enter
both_symbols NOT IN List_1.

Use "Inventory" variables to test a marketmaker's portfolio. To test whether a portfolio is short the security that the marketmaker is buying, enter

$$\text{inventory_buy_shs} < 0.$$

FIG. 61

Edit Pricing Tier

Offer Price

Greater of -- ▼

95 ▼ % of NBBO spread

1.5 ▼ cents per share

Offer Size

1000

Shares ▼

OK

Apply

Close

Greater of -- ▼

Greater of --

Lesser of --

Only % of NBBO

Only cents per share

Shares ▼

Shares

Dollars

Shares + NBBO

Dollars + NBBO

FIG. 62

Creating Marketmaker Toolkit Price/Size Tiers

Use **Price/Size Tiers** to create a set of responses to barter orders that satisfy the conditions of a certain rule.

To create the response tiers, first click on a rule to select it. Then select **New...** from the **Tier** menu. In the **Add Price/Size Tier** pop-up screen, choose an **Offer Price** and an **Offer Size**. (A marketmaker response to a barter order is referred to as an "offer", although both a single-stock bid and a single-stock offer are implied. At the time that the offer is made, a marketmaker knows which security is being bought and which is being sold.)

An offer price may be expressed as a percentage of the current National Best Bid and Offer (NBBO) spread, in incremental cents per share, or as the greater or lesser of those two quantities. For example, suppose an incoming barter order is: "Buy 1000 ABCD / Sell 2000 WXYZ", and suppose the NBBO markets are:

	Bid	Offer
ABCD	52.02	52.05
WXYZ	24.01	24.03.

The NBBO dollar spread for the barter order is \$70.00; i.e., $1000 * 0.03 + 2000 * 0.02$). Therefore, a barter offer price of 90% implies a spread of \$63.00. A marketmaker who offers at 90% would be willing simultaneously to buy WXYZ on the bid and sell ABCD at 52.043. ($\$63 = 1000 * 0.023 + 2000 * 0.02$.)

An offer size is expressed either in shares or dollars, either alone or in addition to the current NBBO depth. An offer size of \$20,000 means that each leg of a barter order may be traded up to that amount.

Marketmakers can attach any number of price/size tiers to a given rule.

FIG. 63

Create Ticker

Ticker Name:

Data Source:

☐ **All Trades**
☐ Trades with **one symbol:**
☒ Trades from **symbol list:**
☐ Trades invoked by **rule:**
☐ Trades invoked by **rule:**
tier:

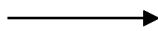
Columns:

☐ Pair
☐ Symbol
☐ Share quantity
☐ Dollar Value
☐ Trade Price
☐ Rule invoked
☐ Price tier
☐ Time stamp

FIG. 64

Trade Ticker							
Name: PHILIPPE							
Data Source: Symbol List "Big Tech"							
Pair	Symbol	Shares	Dollars (000's)	Trade Price	Rule	Tier	Time
	MSFT	+600	44	73.02	BothNDX	89%	9:35:01
XX	INTC	--1200	45	37.12	BothNDX	89%	9:35:01
	CSCO	--1000	24	23.55	MyStocks	97%	9:38:15
	INTC	+200	7	37.02	DollarMatch	90%	9:42:51

Right-click menu



Find Sibling
This Trade Snapshot P&L
All Trades Snapshot P&L

FIG. 65

Using Trade Tickers

Trade Tickers produce in real-time a new line of information for each of the marketmaker's automatic and manual trades.

Marketmakers can create different tickers based on multiple **Data Sources**. For example, one ticker might show the trades for all stocks within a certain user-defined symbol list, while another ticker might show all trades prompted by a selected trading decision rule.

Marketmakers also can select the **Columns** that they want the ticker to show, such as shares traded and trade price, and the rule that invoked a trade. The column **Pair** indicates which trades in a Trade Ticker were executed as part of the same barter order. Certain trades in a Trade Ticker may appear without the corresponding legs of their barter orders since the data source of the ticker excludes one leg. For example, a data source of Nasdaq 100 stocks would exclude IBM from a ticker in the case of a MSFT vs. IBM barter order. In this case, right-clicking on the unmatched trade in the ticker allows a marketmaker to access the trade's "sibling".

Marketmakers can modify, delete, or move Trade Ticker columns by using the Monitor menu, by clicking and dragging column items within the toolkit window, or by right-clicking on the columns in the Trade Ticker screen. Marketmakers can retrieve snapshot P&L information on one or more trades by right-clicking on a trade ticker row.

FIG. 66

Create Position / P&L Report	
Report Name: <input type="text"/>	
Report Breakout: <ul style="list-style-type: none"><input type="radio"/> By stock symbol<input type="radio"/> By rule invoked<input type="radio"/> By rule and tier invoked<input type="radio"/> Show totals only	Data Source: <ul style="list-style-type: none"><input type="radio"/> All Trades<input type="radio"/> Trades with one symbol: <input type="text"/><input type="radio"/> Trades from symbol list: <input type="text"/><input type="radio"/> Trades invoked by rule: <input type="text"/><input type="radio"/> Trades invoked by rule: <input type="text"/>tier: <input type="text"/>
Time Period: <ul style="list-style-type: none"><input type="radio"/> Today, real-time<input type="radio"/> Hours, today: <input type="text"/> hhmm to <input type="text"/> hhmm<input type="radio"/> Prior dates: <input type="text"/> mmddy to <input type="text"/> mmddy<input type="radio"/> Inception to date	Columns: <ul style="list-style-type: none"><input type="checkbox"/> Share Inventory<input type="checkbox"/> Dollar Inventory<input type="checkbox"/> No. of Trades<input type="checkbox"/> Total P&L<input type="checkbox"/> Realized P&L<input type="checkbox"/> Unrealized P&L<input type="checkbox"/> Rule invoked<input type="checkbox"/> Price tier invoked
<div>OK</div> <div>Cancel</div>	

FIG. 67

Marketmaker Position and P&L					
Name: JENNIFER					
Breakout: By Rule / Tier Invoked					
Source: Symbol List "Technical Buy"					
Period: Today / Real-time					
Dollars in 000's					
Rule	Tier Price	Dollar Inventory	Total P&L	Realized P&L	Unrealized P&L
ALL	ALL	300	18	10	8
Dollar Match	ALL	(1,200)	13	8	5
	90%	1,000	8	3	5
	98%	(1,000)	4	3	1
	105%	800	1	2	(1)
My Stocks	ALL	(900)	8	1	7
	95%	1,200	6	1	5
	100%	(2,100)	2	0	2
Both NDX	ALL	2,400	(3)	1	(4)
	95%	400	(2)	(1)	(1)
	99%	700	(3)	1	(4)
	104%	1,300	2	1	1

FIG. 68

Marketmaker Position and P&L				
Name: ROBERT				
Breakout: By Symbol				
Source: Symbol List "Big Tech"				
Period: Today / Real-time				
Dollars in 000's				
Symbol	Share Inventory	Total P&L	Realized P&L	Unrealized P&L
ALL		18	10	8
CSCO	+2,200	3	2	1
INTC	(1,000)	4	5	(1)
JDSU	+3,000	(2)	1	(3)
MSFT	+800	6	3	3
SEBL	(1,200)	4	(2)	6
SUNW	(2,100)	3	1	2

Right-click menu —→

See Individual Trades for this Row

FIG. 69

Using Position and Profit & Loss Reports

A **Position and P&L Report** (PPL) shows the cumulative share and/or dollar inventory along with profit & loss calculations, for all of the marketmaker's automatic and manual trades. Multiple PPLs may be created and viewed simultaneously. The information in these reports may be grouped ("**Report Breakout**") as the user desires, and the trades which comprise these reports may be a chosen subset ("**Data Source**") of all trades.

For example, the user may have P&L grouped and summarized by security symbol, or according to the trading decision rule or rule/tier combination which invoked each trade. The data source can be a subset of stock symbols (designated by a Symbol List name), or it can be all trades invoked by a Marketmaker Toolkit rule or rule/tier combination. Therefore, marketmakers can monitor on a real-time basis the profit and loss contribution of each decision rule and price/size tier that they create. This gives them incredible insight into the productivity of their rules and allows them to improve profitability over time.

Share and dollar inventories of securities, and realized, unrealized, and total P&L's can be generated either on a real-time basis or for historical periods. Report **Columns** can be chosen, modified, and moved as they are for Trade Tickers.

Any row in a Position and P&L Report can be right-clicked to generate a new report of individual trades that comprise the row.

FIG. 70

BarterSecurities Request for Manual Offer

Incoming Order

Buy 1000 MSFT

Sell 2000 INTC

MSFT + \$55,000

INTC -- \$54,000

Delta 1%

View Level II

Modify Defaults

Offer Size

1000

500

100

MSFT

500

x

INTC

1000

100

500

1000

Full Size

Offer Price

	Last	Chg	Bid	Ask	Size
MSFT	54.98	+1.30	54.98	55.00	500 x 500
INTC	27.01	+0.80	27.00	27.02	200 x 1000

Buy on real-time bid;

Sell on real-time ask

plus

minus

0.1

cents.

0.1

0.5

1.0

Offer

Time Remaining

15

Stop

Cancel

FIG. 71

BarterSecurities Edit Manual Offer Defaults

General

Timeout seconds begins at

15

☐ View Level II automatically.

Offer Size

☐ Use Marketmaker Toolkit price/size tiers

☒ Maximum number of shares, either leg =

1000

☐ Maximum number of dollars, either leg = \$

☐ Round dollars up to next higher round lot.
☐ Round dollars down to next lower round lot.

Offer Price

☐ Use Marketmaker Toolkit price/size tiers

☒ Offer inside NBBO, in cents, by

0.1

☐ Offer outside NBBO, in cents, by

☒ Allow variable Ask Price
☐ Allow variable Bid Price
☐ Allow variable Bid and Ask Prices

OK

Reset

Cancel

FIG. 72

Responding with Manual Offers

The BarterSecurities Marketmaker Toolkit lets you define rules that automatically generate one or more offers on the Limit Offer Book for an incoming barter order when predefined conditions are met. However, you may specify in the rule that when the stated conditions are met, you are to be alerted so that you can make a manual response to the order rather than having offers generated automatically.

When the BarterSecurities Request for Manual Offer screen appears, you can review the incoming order and then (1) deliver an offer according to the price and size defaults that you set, (2) deliver an offer after modifying the price and/or size defaults, (3) close the screen manually without delivering an offer, or (4) let the screen close automatically, after a stipulated number of seconds, without delivering an offer. *Note that as long as the countdown clock is running, the sender of the incoming order will be aware that a manual offer is pending and may be delivered.*

The BarterSecurities Request for Manual Offer screen is partitioned into four sections from top to bottom: (1) Incoming Order, (2) Offer Size, (3) Offer Price, and (4) Action.

Incoming Order

On the left is the incoming order expressed as it was entered; that is, *the marketmaker may take the other side of the trade*. In the following discussion, the term "buy-side" ("sell-side") refers to the security that the sender is buying (selling) and that the marketmaker may sell (buy). The dollar values of both the buy-side and sell-side securities are shown, along with the **Delta** of the trade. The smaller the delta, the closer together are the buy-side and sell-side dollar values. A delta of zero implies that the dollar values match. A delta of one implies that the barter order is almost one-sided.

FIG. 73A

The marketmaker may click the View Level II button to view real-time Level II quotes for the buy- and sell-side securities. The marketmaker may click the Modify Defaults button to change how the default Offer Size and Offer Prices are determined when the Request for Manual Offer screen pops up.

Offer Size

An offer size for the incoming barter order is calculated based on either (1) the price/size tiers stipulated in the Marketmaker Toolkit, or (2) the defaults that you specify in the Edit Manual Offer Defaults screen. The quantities in the offer size are always in the same ratio as the quantities in the incoming order. If you wish, you may change the initial size by (1) clicking the size increment/decrement buttons, (2) by typing in a new size in the buy-side or sell-side fields (the opposite size is changed to retain the incoming share ratio), or (3) clicking the **Full Size** button, which causes the offer size to become the same as the incoming order size.

Offer Price

An offer price for the incoming barter order is calculated based on either (1) the price/size tiers stipulated in the Marketmaker Toolkit, or (2) the defaults that you specify in the Edit Manual Offer Defaults screen. If you wish, you may change the initial offer price by (1) clicking the price increment/decrement buttons, or (2) by typing in a new value in the available field.

Action

At any time, you may (1) click the green **Offer** button to send your offer as stated, (2) click the red **Cancel** button to close the screen without sending an offer, or (3) click the **Stop** button to stop the rundown clock. If you make none of these actions, the screen will close automatically when the clock has run down to zero.

FIG. 73B

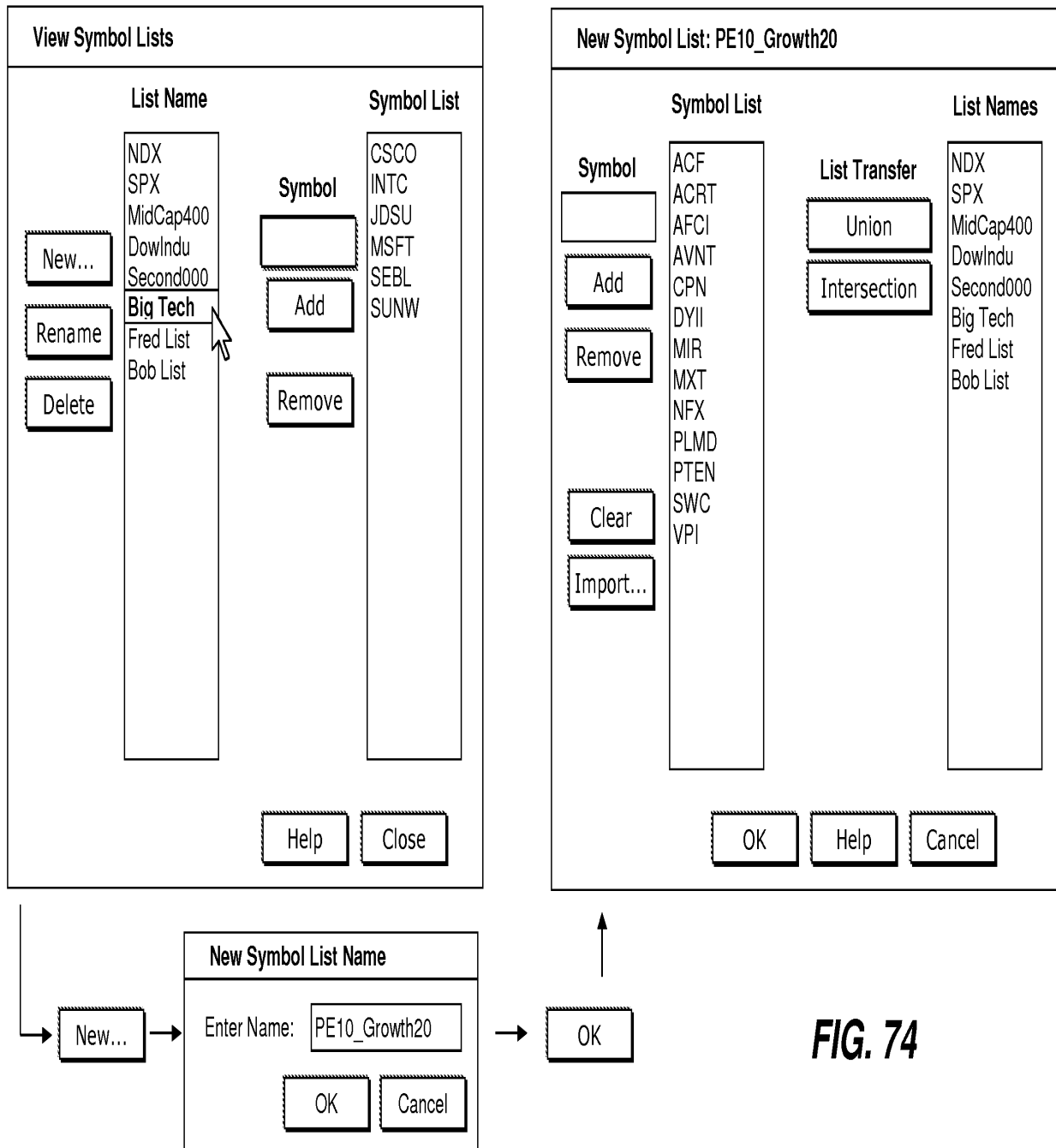


FIG. 74

View Symbol Lists

New

Click **New** to create a new symbol list. A pop up screen requests the name of the new symbol list.

Rename

Select a symbol list name and click **Rename** to rename a symbol list while keeping its symbols intact. To base a new symbol list on the symbols in an existing list, use the **New...** function.

Delete

Select a symbol list name and click **Delete** to remove the list name, along with its symbols.

Add

Fill in the **Symbol** field and click **Add** to add one symbol to the selected symbol list.

Remove

Select a symbol from the **Symbol List** column and click **Remove** to remove the symbol from the selected symbol list.

FIG. 75

New Symbol List

Add

Fill in the **Symbol** field and click **Add** to add one symbol to the new symbol list.

Remove

Select a symbol from the **Symbol List** column and click **Remove** to remove the symbol from the new symbol list.

Clear

Click to remove all symbols from symbol list.

Import

Click to copy a symbol list from another application.

Union

To add the symbols from an existing symbol list to the symbols in the **Symbol List** column, select one or more names from the **List Names** column and click **Union**. Duplicate symbol names will be removed from the new list.

Intersection

To create a new list from symbols that are common to the symbols in the **Symbol List** column and the symbols in one or more existing lists, select the names from the **List Names** column and click **Intersection**.

FIG. 76